TECHNOLOGY DEPT.

Tech
The OIL AND GAS JOURNAL

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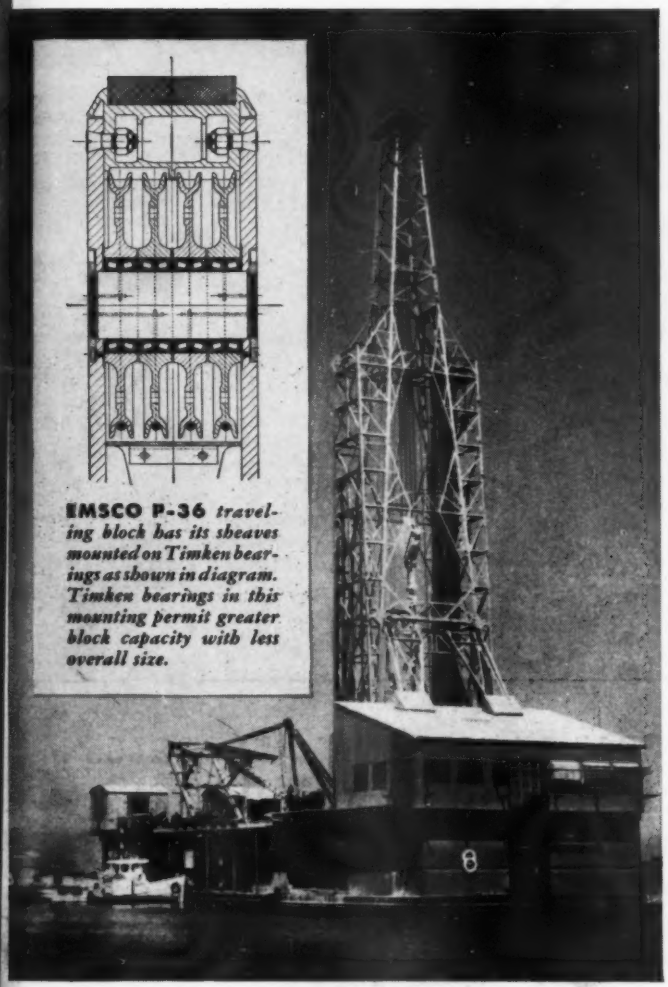
MAR 5 1951

New portable mast traveling block gives more capacity—takes less space



EMSCO P-36 *traveling block has its sheaves mounted on Timken bearings as shown in diagram. Timken bearings in this mounting permit greater block capacity with less overall size.*

DESIGNED for use in portable masts, like in the offshore drilling rig shown at left, the new Emsco P-36 traveling block combines large capacity with small size. It's rated at 300 tons. Yet it measures only 82½″ in length, 40½″ on the face, and 22¼″ in width.

To make possible this combination of compactness and capacity, the sheaves of the P-36 are mounted on Timken® tapered roller bearings. Due to tapered design, Timken bearings take both radial and thrust loads—provide greater sheave stability. In fact, the mounting of tapered roller bearings in this sheave gives greater stability than would be possible with any other type of bearing. Because of the line contact between rollers and races, Timken bearings give extra load capacity in minimum space. And Timken bearings can be depended upon to hold up under heavy loads because they are made of Timken fine alloy steel, are engineered for the job, and are manufactured to extreme accuracy.

Timken bearings also save lubrication time and minimize friction. They assure freely rotating sheaves and fast dropping empty blocks.

Timken bearings add extra value to any product in which they are used. When you buy new equipment, be sure it's Timken bearing equipped. And when you buy bearings, be sure they carry the trade-mark "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TIMKEN
TRADE MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ↓ AND THRUST →○← LOADS OR ANY COMBINATION →✳←

XUM

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Only through intensive research, brutal testing and highly efficient manufacturing facilities can leadership be maintained in the science of cementing. HOWCO'S skilled technicians constantly test, analyze, check and recheck. Their goals are to create, improve and produce more efficient cementing tools... all of which must surpass the highest standard in the industry. Halliburton's achievements have revolutionized cementing. Remember, *there's no substitute for experience in oil well cementing.* Be sure... *depend* on Halliburton.

HALLIBURTON OIL WELL CEMENTING CO. DUNCAN OKLAHOMA

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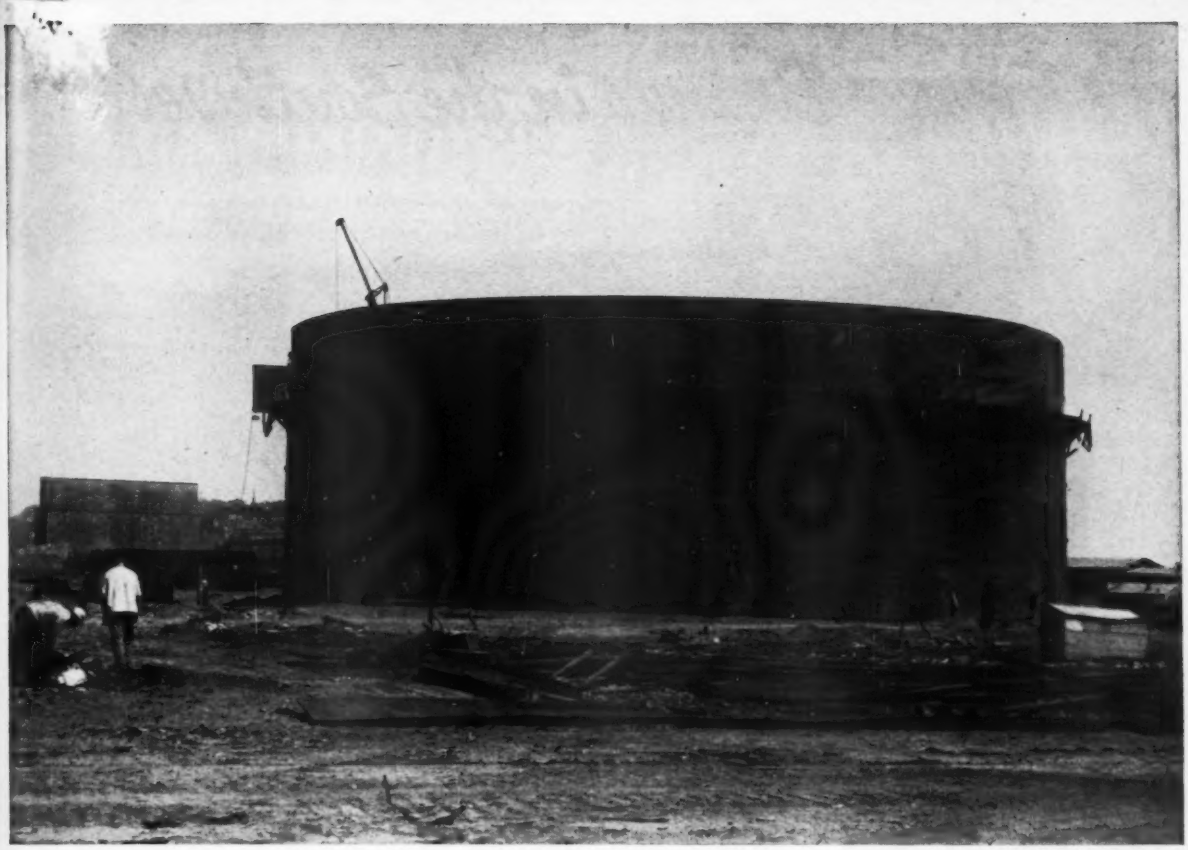

Courtesy Portland (Me.) Evening Express

One of six Bethlehem-built storage tanks photographed during construction of Pocahontas Calso Terminal at South Portland, Maine

New Oil Terminal Serves Northern New England

In order to meet the needs of northern New England for various types of oil, the Pocahontas Terminal Corporation recently constructed a new, completely equipped oil terminal at South Portland, Maine.

Construction at the 23-acre site called for the erection of four 120 ft x 48 ft, 96,690-bbl cone-roof tanks; one 120 ft x 48 ft, 96,690-bbl reinforced-roof tank; and one 90 ft x 48 ft, 54,390-bbl lifter-roof tank.

Fabrication and erection of all six storage tanks was handled by Bethlehem.

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On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

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Realizing that low-cost transmission of natural gas, from its source on the Gulf Coast to the Northern and Eastern seaboard was vital to America's well-being, Texas Eastern Transmission Corporation purchased the Big Inch and the Little Big Inch Pipe Lines from the Government and converted them from oil and gasoline transmission to gas. The conversion contract was awarded to Brown & Root, Inc., who has done an outstanding job of converting and expanding this vast system.

The Brown & Root staff of specialists makes possible a completely integrated service, including plant location, thorough planning and supervision of construction, and delivery of a ready-to-operate plant, all under one contract . . . one responsibility. If your company's plan calls for new construction or expansion, at your invitation a Brown & Root expert will gladly make a complete survey for you. Why not call or write today; there is, of course, no obligation involved.

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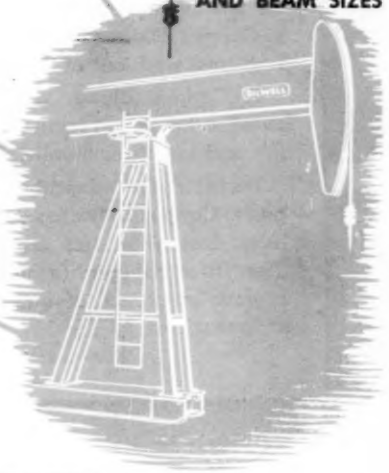
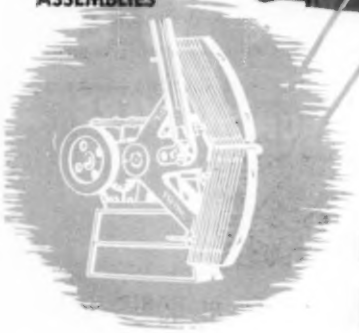


A VARIETY OF PITMAN, CRANK AND SUB-BASE ASSEMBLIES



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Naturally, your first saving comes from getting a unit that will do your pumping job safely, dependably, efficiently—without investing in unnecessary capacity. Additional savings accrue because of the extent to which sub-assemblies can be interchanged in the field on units to secure varying capacities —thereby reducing maintenance requirements to a minimum.

The chart, at right, tells the story of how combinations of 10 gear-case sizes and 9 frame-and-beam sizes plus a variety of pitman, crank and sub-base assemblies, result in a total of 44 individual units. By means of bolt-on base extensions to the larger sizes, for electric motors, multi-cylinder and single-cylinder engines, a total of 108 possible arrangements is available to meet varying power applications without costly field modifications.

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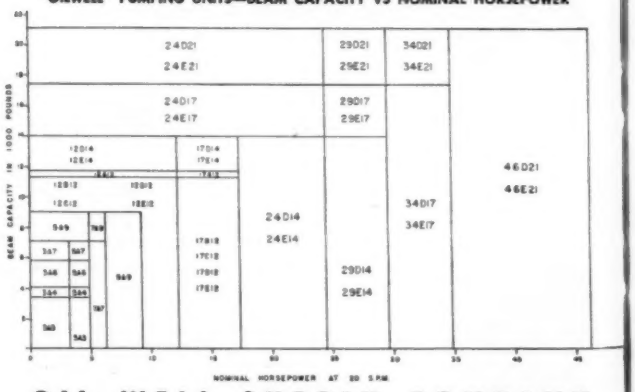
"OILWELL" PUMPING UNITS—BEAM CAPACITY VS NOMINAL HORSEPOWER



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To get positive protection against liner washouts... greater portability... more horsepower per pound... and rugged dependability... get an Emsco "D" Series Slush Pump. Call your local supply store or Emsco representative.

EMSCO SLUSH PUMPS COME IN THESE SIZES:

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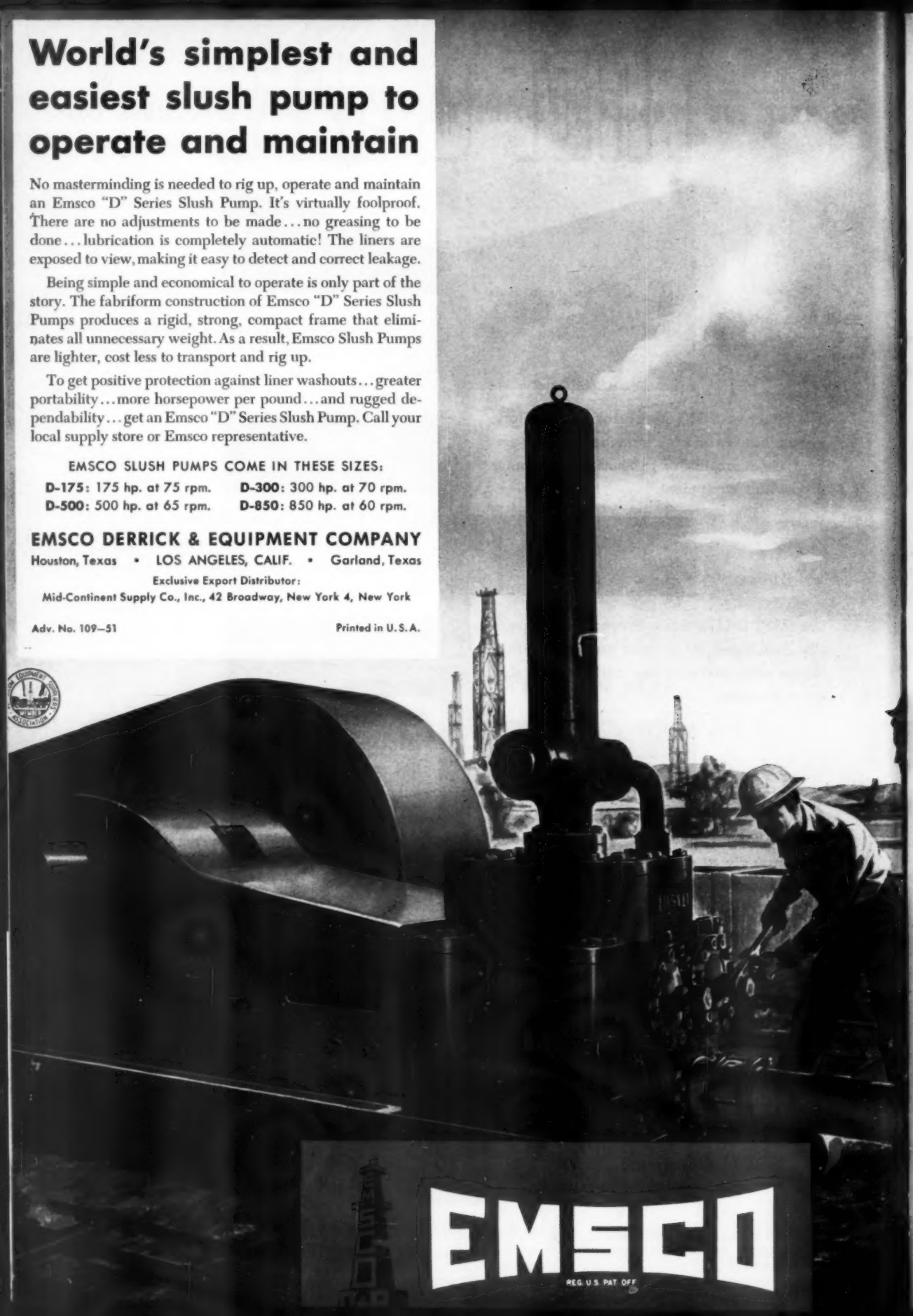

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Conduit-type, double-seating disc in this new Crane valve has circular openings that coincide with seat openings. Flow resistance is reduced to a minimum. There are no pockets to accumulate dirt or contaminating fluids. Turbulence and erosion of seating surfaces are avoided.

Easy operation, long life, and reduced maintenance are assured by provision for thorough lubrication of all working parts. Body and bonnet are packed with grease which is retained by patented spring-loaded plates. Stem is inclosed in grease filled yoke with lubrication fitting.

Ask your Crane representative about these new valves for crude, finished product, and gas lines.

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They Say—

"Below the Belt" a Hit

Sir:

I have read with a great deal of interest and satisfaction the splendid editorial entitled, "Below the Belt," which appeared in the February 8, 1951, issue of The Oil and Gas Journal.

I wish to take this opportunity to congratulate you and your associates on this fine, sound, constructive, truthful, and timely editorial. Certainly the time has arrived for everyone concerned to courageously answer unjustified, prejudiced, and emotional attacks on the sound provisions of the income-tax laws pertaining to oil and gas production, particularly the percentage-depletion allowance and the option to expense intangible drilling and development costs. Irrespective of the position of any individual making such unwarranted attack, they should be answered vigorously, courageously, and factually, without withholding any punches. That was done in your editorial.

Smear campaigns, even by the President, have no place when an industry is doing an outstanding job and when it is being called upon to do even more and is at the same time bearing a much greater tax burden than most any other industry.

The action of your publication in promptly defending the petroleum industry against these unwarranted attacks and in doing so in such a vigorous manner is, I am sure, greatly appreciated by all those engaged in the petroleum industry.

H. B. Fell,
Executive Vice President,
Independent Petroleum Association of America,
Tulsa, Okla.

Sir:

Let me be among the first to congratulate you and your associates on the courageous, forthright, and timely editorial entitled "Below the Belt," which appeared in the February 8, 1951, issue of The Oil and Gas Journal.

The time has most certainly come to "call a spade a spade," and the referred-to editorial did just that. The smear campaign continues—and yet in the same breath the administration requests the industry to evolve plans for increasing its production of crude oil by another million barrels per day. I, for one, believe it is time for a little "plain talk."

So again, let me congratulate and thank you and your great Journal for promptly rising to the defense of the petroleum industry—and doing it in such an intelligent and vigorous fashion.

Clarel B. Mapes,
General Secretary,
Mid-Continent Oil and Gas Association,
Tulsa, Okla.

Oil Industry Threatened

"The misfits of the Truman administration are on the prowl again.

"At a time when industry is going all out to provide the stepped-up production required for the rearmament program, one of the businesses most vital to the nation's welfare and security must take time off to fight for its very existence against an asinine administration proposal.

"The industry is oil. The proposal is that made to Congress by Treasury Secretary Snyder for substantially reducing the rate in the depletion-allowance clause of the Revenue Act. This clause recognizes the tremendous risks involved in the search for new oil reserves. . . .

"No other industry is as hazardous as that of producing oil. . . .

"It is generally recognized that the depletion allowance is the incentive that has kept the nation's reserves

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Call Ryerson for Quick Shipment

The country's largest stocks of stainless tubing and pipe await your call at Ryerson. On hand for immediate delivery are nineteen distinct kinds—both seamless and welded—in a wide range of sizes. Our stocks also include stainless pipe fittings and fastenings for every requirement.

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Schedule 80—Extra Heavy Weight—Seamless
TP316 PIPE.....Schedule 5—Light Wall—Welded
Schedule 10—Light Wall—Welded
Schedule 40—Standard Weight—Seamless & Welded
TP347 PIPE and/or 304ELC —
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Schedule 80—Extra Heavy Weight—Seamless

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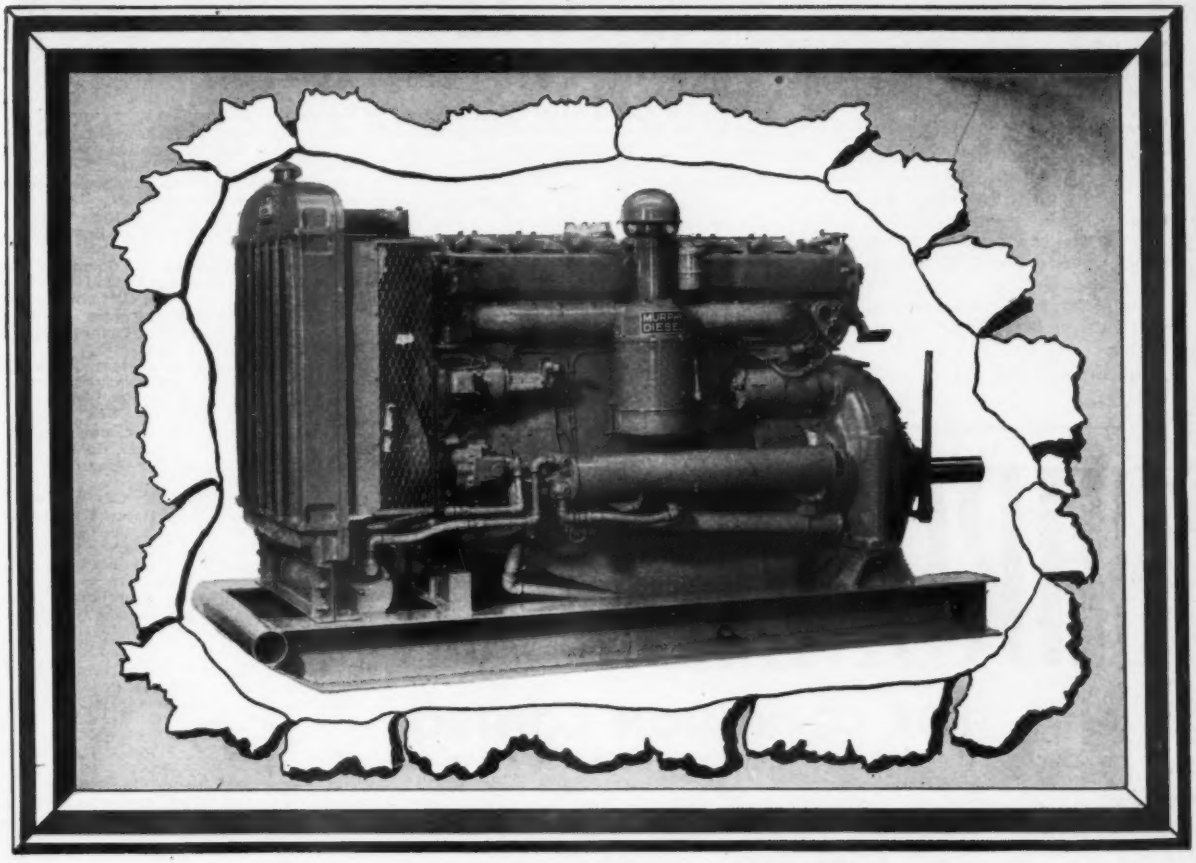

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abreast of the steadily growing demands for oil and oil products. Without it the search for new fields would be seriously curtailed. For oil men simply cannot afford to gamble away their capital.

"Oil is vital to the welfare of this nation. Any attempt to stymie the industry, such as by curtailment of the depletion allowance, can be disastrous. Congress should turn a deaf ear to the socialistic schemers and leave undisturbed a proven plan that oiled the way to victory in World Wars I and II and will safeguard the future petroleum needs of the nation.

Editorial in The Oil City (Pa.) Derrick.

CALENDAR

1951

March

American Association of Petroleum Geologists, Rocky Mountain Section, Shirley Savoy Hotel, Denver, March 1-2.

New York Oil Heating Association, Inc., Hotel Statler, New York, March 5.

American Society for Testing Materials, spring meeting and committee week, Cincinnati, March 5-9.

Pacific Coast Gas Association, technical-services conference, Ambassador Hotel, Los Angeles, March 7-8.

American Petroleum Institute, division of production, southwestern district meeting, Hotel Beaumont, Beaumont, Tex., March 7-9.

American Institute of Electrical Engineers, Tulsa section, joint meeting with Student Branch, Oklahoma A. & M. College, A.I.E.E., March 8.

Indiana Independent Petroleum Association, spring convention and refiners and suppliers exhibit, Hotel Severin, Indianapolis, March 8-9.

Texas Oil Jobbers Association, Inc., spring convention and refiners and suppliers exhibit, Shamrock Hotel, Houston, March 9-10.

Mid-West Gas Association, Hotel Fontenelle, Omaha, March 12-14.

First South American Oil Congress, Montevideo, Uruguay, March 12-16.

Illinois Petroleum Marketers Association, annual convention, Sherman Hotel, Chicago, March 13-15.

National Association of Corrosion Engineers, annual conference and exhibition, Statler Hotel, New York City, March 13-16.

Gas Appliance Manufacturers Association, annual meeting, The Homestead, Hot Springs, Va., March 19-21.

Ohio Petroleum Marketers Association, annual convention and marketing exposition, Deshler-Wallick Hotel, Columbus, Ohio, March 20-22.

American Petroleum Institute, division of production, Mid-Continent district spring meeting, Herring Hotel, Amarillo, March 21-23.

North Texas Oil and Gas Association, annual meeting, Kemp Hotel, Wichita Falls, Tex., March 24.

Texas Independent Producers and Royalty Owners Association, fifth annual meeting, Beaumont, Tex., March 27-28.

New England Gas Association, annual meeting, Hotel Statler, Boston, March 29-30.

April

American Gas Association, industrial and commercial gas section, conference on industrial and commercial gas, Shoreham Hotel, Washington, D. C., April 2-4.

Western Petroleum Refiners Association, annual meeting, Plaza Hotel, San Antonio, April 2-4.

American Society of Mechanical Engineers, spring meeting, Atlanta, April 2-5.

Oil-Heat Institute of America, annual convention and National Oil-Heat Exposition, Navy Pier and Palmer House, Chicago, April 2-6.

Instrument Society of America, New Jersey section, Essex House, Newark, N. J., April 3.

American Petroleum Institute, division of production, Eastern district meeting, Deshler-Wallick Hotel, Columbus, Ohio, April 3-5.

Pacific Coast Gas Association, annual distribution (technical) meeting, Riverside, Calif., April 4-5.

Midwest Power Conference, fourteenth annual meeting, Sherman Hotel, Chicago, April 4-6.

New York Oil Heating Association, Inc., Hotel Statler, New York, April 9.

Mid-West Regional Gas Sales Conference, Edgewater Beach Hotel, Chicago, April 9-11.

Michigan Petroleum Association, annual spring convention, Detroit Leland Hotel, Detroit, April 10-11.

Southwestern Gas Measurement Short Course, University of Oklahoma, Norman, April 10-12.

American Institute of Electrical Engineers, District 4 meeting, McFadden-Deauville Hotel, Miami, April 11-13.

American Gas Association, distribution, motor vehicle, and corrosion conference, Hotel Peabody, Memphis, April 16-18.

American Society of Lubrication Engineers, annual convention and lubrication show, Bellevue-Stratford Hotel, Philadelphia, April 16-18.

Petroleum Industry Electrical Association and Petroleum Electric Supply Association, twenty-third annual joint conference, Hotel Adolphus, Dallas, April 17-19.

National Petroleum Association, Hotel Cleveland, Cleveland, April 18-20.

American Petroleum Institute, Rocky Mountain district spring meeting, Gladstone Hotel, Casper, Wyo., April 19-20.

Brussels International Fair, twenty-fifth annual event, Brussels, Belgium, April 21-May 6.

Southern Gas Association, Buena Vista and Edgewater Gulf hotels, Biloxi, Miss., April 23-25.

American Association of Petroleum Geol-

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FOR CORROSION CONTROL

REFINERY COOLING WATER FOR CONDENSERS AND HEAT EXCHANGERS

The equipment being cooled, as well as the cooling towers and evaporating condensers, may be protected by starting with 1000 ppm of Sodium Bichromate, and adjusting to about pH 7 to 9. After about one month, the strength may be reduced gradually to the most economical concentration, usually 200 to 500 ppm. Under close control, even lower concentrations may be employed with safety.

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Probably the most costly parts of a natural gas processing plant are the compressors and engines. The several types of cooling systems require minor differences in Chromate treatment; but, generally, in large installations it is customary to employ concentrations of 400 to 1000 ppm of Chromate.

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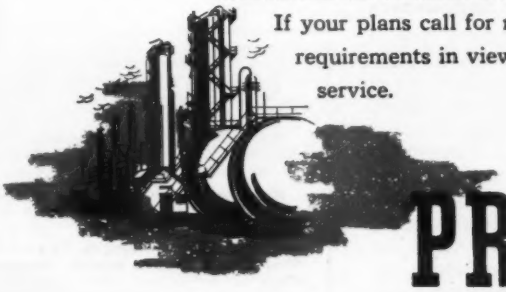
If your plans call for refinery construction work, we will be glad to discuss requirements in view of giving you the benefits provided through Procon service.



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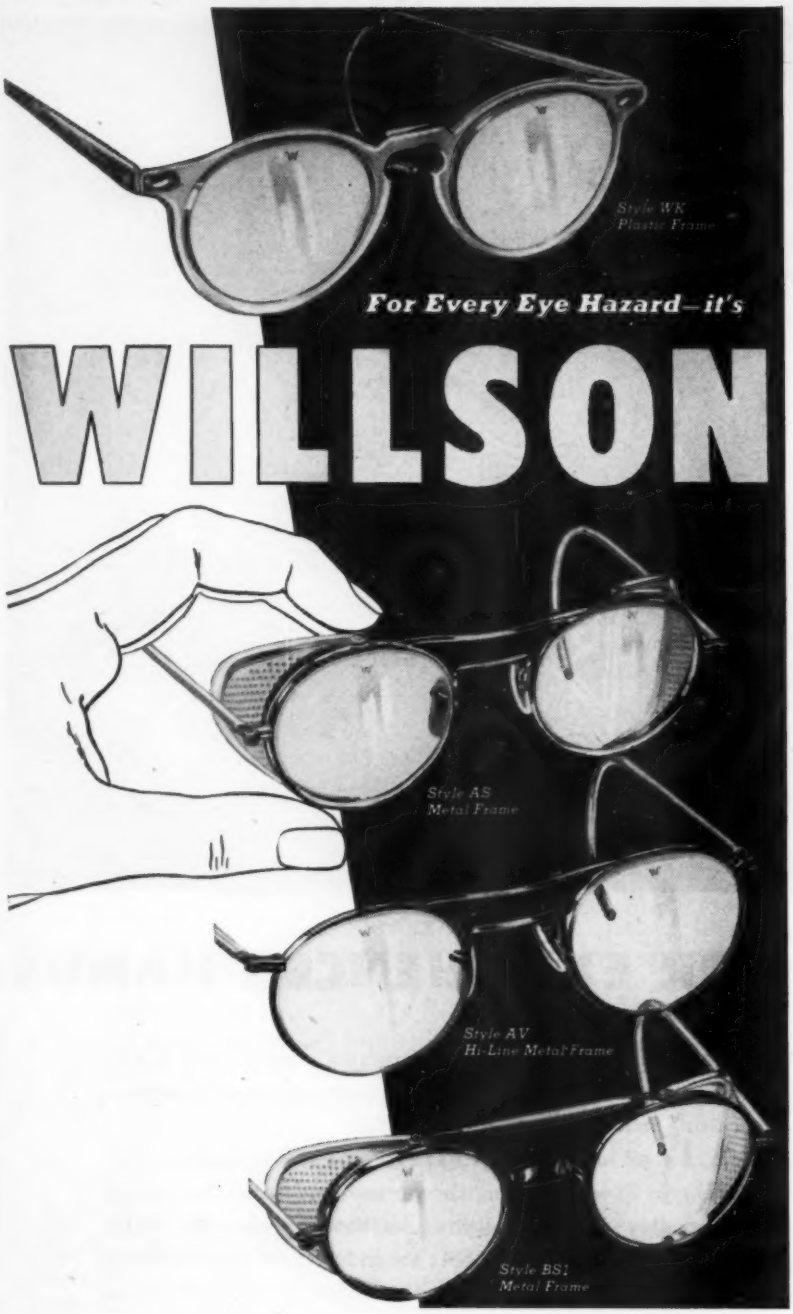

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ogists, Society of Economic Paleontologists and Mineralogists, Society of Exploration Geophysicists, joint annual meeting, Jefferson Hotel, St. Louis, April 23-26.

Natural Gasoline Association of America, annual convention, Mayo Hotel, Tulsa, April 25-27.

Indiana Gas Association, French Lick Springs Hotel, French Lick, Ind., April 26-27.

Interstate Oil Compact Commission, spring meeting, La Fonda Hotel, Santa Fe, N. M., April 26-28.

American Gas Association, industrial and commercial gas section, industrial gas school, William Penn Hotel, Pittsburgh, April 29-May 4.

American Geophysical Union, thirty-second annual meeting, National Academy of Sciences, Washington, D. C., April 30-May 2.

American Petroleum Institute, division of refining, sixteenth mid-year meeting, Mayo Hotel, Tulsa, April 30-May 3.

Materials Handling Conference, International Amphitheatre, Chicago, April 30-May 4.

May

American Institute of Electrical Engineers, District 1 meeting, Hotel Syracuse, Syracuse N. Y., May 2-4.

New York Oil Heating Association, Inc., Hotel Statler, New York, May 7.

American Gas Association, Natural-Gas Department, Dallas, May 7-8.

Independent Petroleum Association of America, mid-year directors' meeting, Cosmopolitan Hotel, Denver, May 7-8.

Gas Appliance Manufacturers Association, natural-gas department spring meeting, Dallas, May 7-9.

Liquefied Petroleum Gas Association, annual convention and trade show, Stevens Hotel, Chicago, May 7-10.

American Petroleum Institute, division of production, Pacific Coast district, spring meeting, Biltmore Hotel, Los Angeles, May 10-11.

American Institute of Chemical Engineers, regional meeting, Hotel Muehlebach, Kansas City, May 13-16.

American Gas Association, operating section, production and chemical conference, Hotel New Yorker, New York City, May 14-16.

Pennsylvania Gas Association, Wernersville, Pa., May 15-17.

Pacific Coast Gas Association, annual transmission (technical) conference, Bakersfield, Calif., May 16-17.

American Institute of Electrical Engineers, District 5 meeting, Loraine Hotel, Madison, Wis., May 17-19.

Empire State Petroleum Association, Inc., Hotel Statler, Buffalo, N. Y., May 20-22.

American Petroleum Institute, division of marketing, mid-year meeting, Cincinnati, May 28-29.

Third World Petroleum Congress, Kurhaus, Scheveningen, the Netherlands, May 28-June 6.

American Petroleum Institute, standardization and standing committees, division of production, mid-year meeting, Brown Palace Hotel, Denver, May 28-June 1.

Institution of Gas Engineers, London, England, May 29-June 1.

Natural Gas and Petroleum Association of Canada, Royal Connaught Hotel, Hamilton, Ont., May 31-June 1.

NOMADS

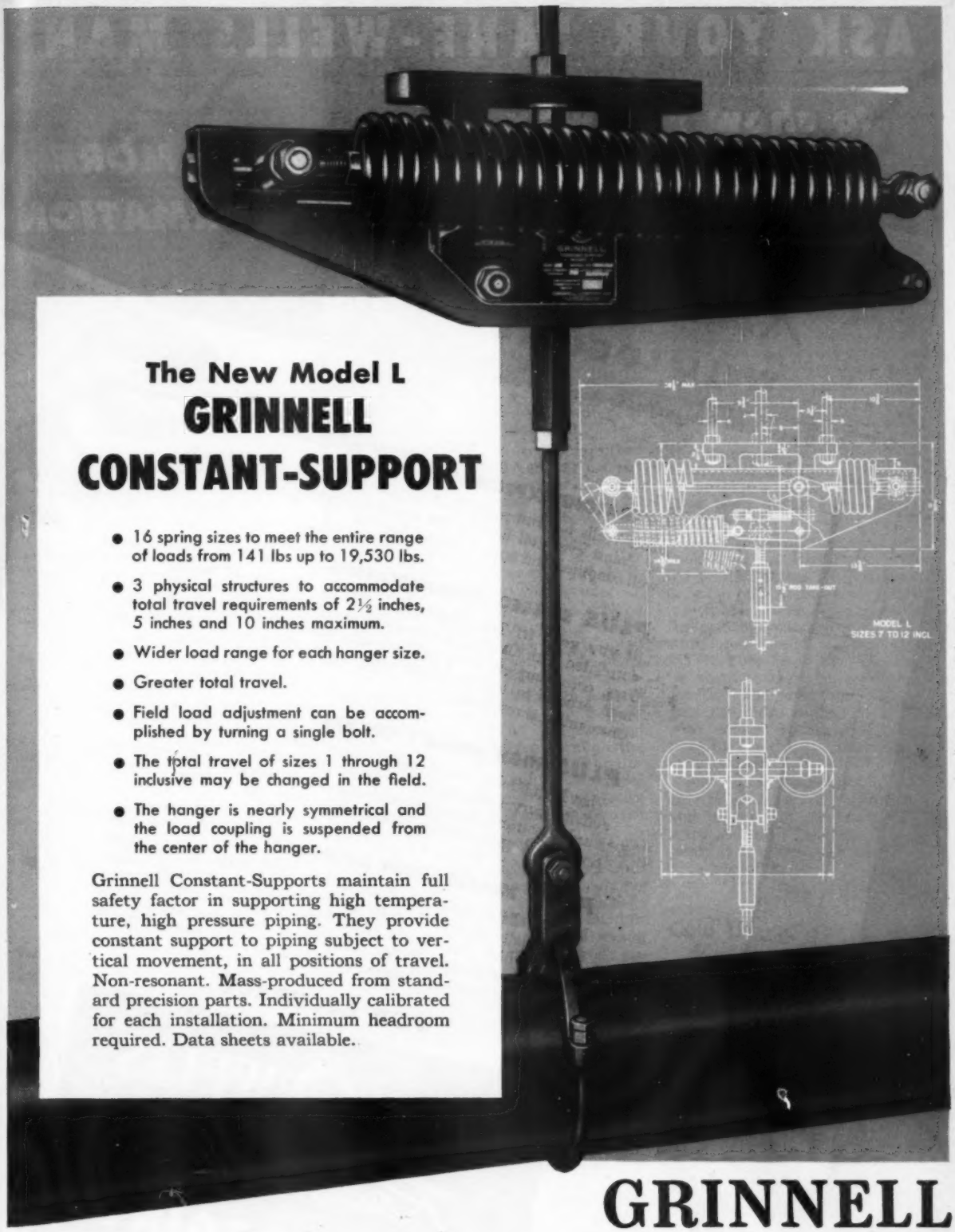
Tulsa Nomads, third Friday of each month. After Five Room, Tulsa Hotel.

Dallas-Fort Worth Nomads, first Monday of each month, Greater Dallas Club.

Houston Nomads, second Monday of each month. Ye Ole College Inn, Houston.

Los Angeles Nomads, second Wednesday of each month, Jonathan Club.

New York Nomads, first Monday of each month, Louis Sherry's, 300 Park Ave.



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JOURNALLY Speaking

Odd Coincidence Dept.

ODD coincidence happened to us the other day. We read a newspaper clipping telling that Pittsburgh Consolidation Coal Co., largest producer of bituminous, will build a pipe line in eastern Ohio to move coal as a slurry, finely ground and mixed with water so it can be pumped like fluid.

"Humph," we mused, "so other industries are finally getting around to the oil industry's method of transportation. Maybe pipe lines will be used for most everything someday."

Five minutes later we opened the bound volume of The Oil and Gas Journal for 1913, and in the February 27 issue read this item:

"A company has been organized and financed in Chicago with Isham Randolph, one of the most noted engineers of America, at its head, for the purpose of mining and transporting coal by pipe line in exactly the same manner as oil is now transported. . . . The coal is mixed with water and driven through the lines by electrically driven centrifugal pumps. . . . Should we school our minds to receive the intelligence of the successful transportation of grain and cereals by pipes?"

History repeats, there's nothing new under the sun, great minds run in the same channel, and similar bromides. We don't know what happened to that 1913 experiment, but we do know that coal is still being shoveled while oil and gas are piped, which may have something to do with the changed position of the two fuels and with the current attempt to borrow one of the petroleum industry's secret weapons.

Birthday Book

HOW come, some may ask, did we happen to be going through a 1913 volume when we found that coal-by-pipe-line item?

That was no happenstance. Our entire staff is right in the big middle of a job of historical research, combing the old files of our favorite oil publication and a mass of other material. Why? Because we're getting ready for a big birthday party next May when we enter our fiftieth year of continuous publication.

At this party we are going to give a birthday present instead of get one, and you, you lucky subscribers, are going to get it. It will be a big book, bound separately from our regular issues, on the history of the oil industry in the Southwest. That history goes back 50 years to the Spindletop discovery, and so does the Journal. There wasn't an oil industry worthy of the name in the Southwest before Spindletop, nor was there a real oil paper. Both got their start at Spindletop half a century ago, and both have been going great guns ever since.

We'll tell you more about this book later on. Right now we're in the painful throes of deciding what to leave out. A lot of very interesting things have happened during the past 50 years, and we have accumulated enough material to write a Five Foot Shelf of our own. But we want to make this history easy reading and fast moving, giving only the more important highlights with enough background of conditions at the time to show their significance and relationship.

We are far enough along to be able to promise a highly interesting and useful volume, one that you'll want to read and keep. But be patient; it won't be off the press for a couple of months.

Cold Threat

HERE'S a new threat to the future of the petroleum industry, or, to look at it another way, a new white hope for the country if, as, and when we run out of oil. It's dry ice, that supercold stuff you often get with packaged ice cream. As it warms up it gives off a lot of harmless but expansive gas.

Now a man out in California has harnessed this "cold steam" to run a model railroad engine and, in true California spirit, he believes it can run all kinds of big engines and soon may become the universal source of energy. Maybe so. We don't know much about the sources of production of dry ice, but we're not going to start worrying until its output gets up to a few million barrels per day.

—Henry D. Ralph

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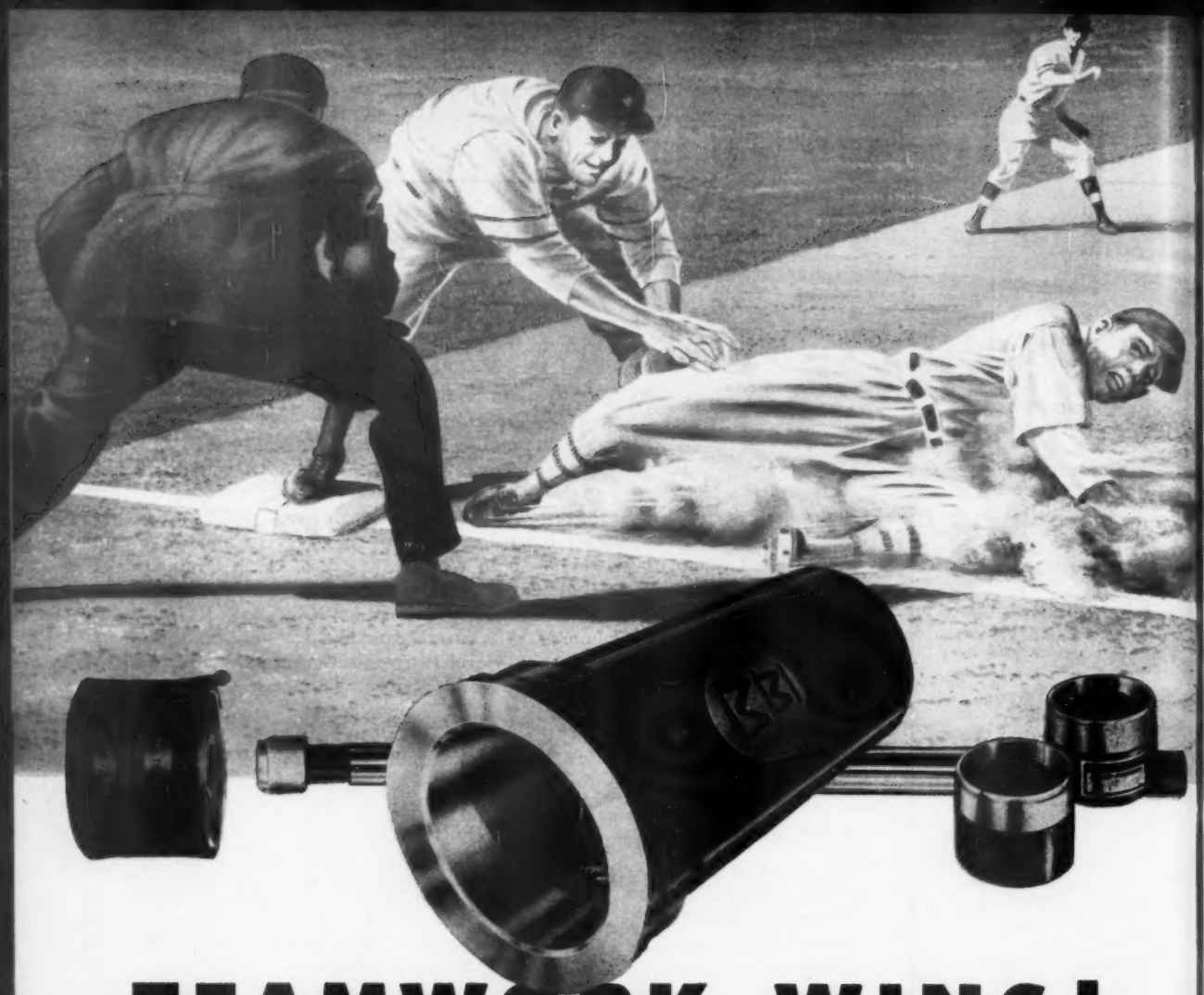

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Lesson in Lead

Oil men are an independent lot. Tell them they have to do something, and they buck like steers. Ask their help in solving a difficult problem, and they work their heads off to find a practical answer.

The recent controversy over conservation of tetraethyl lead, now happily ended, well illustrates this point and constitutes a neat case study in government-industry teamwork in solving defense problems.

The problem here was to set aside some tetraethyl lead to build a stockpile for future emergency use in aviation gasoline. Practically all the TEL being produced goes into motor gasoline to increase its octane rating. Therefore, it seemed logical to assume that the way to save TEL was to put a ceiling on octane ratings. A limitation order was prepared.

Fortunately, the proposed order was shown to the oil industry before it was promulgated. Protests were immediate and violent, not against the objective of saving TEL, but against the method of doing it. A conference was held and industry men suggested better plans. The Petroleum Administration for Defense has now adopted the essential features of the industry proposals and dropped its scheme for an octane ceiling.

The industry plan, according to its proponents, has these advantages: It will be easier on motorists, will impose fewer difficulties on refiners and distributors, cause fewer hardships to small refiners, avoid disruption of traditional and geographic practices in gasoline marketing, maintain competition in the industry, and encourage instead of discourage ingenuity in making high-octane gasoline while economizing on the use of TEL. And it will save more lead than the government plan.

If these claims are substantiated—and PAD was impressed by them—everybody gains from the reconsideration. But the most important gain is in the principle of industry consultation.

A big lesson of World War II was that the oil industry will fight like a wildcat against bureaucratic regulations which it considers unnecessary, impractical, or unduly disruptive, but will work even harder and undergo greater sacrifices to achieve a war objective if permitted to work out its own methods in its own way.

It is a fetish of government regulators that any industry, given half a chance, will curtail competition and eliminate small operators. But in this TEL squabble the big refiners fought for the rights of the small ones, and those who would not be hurt by the proposed order fought for those who would be injured by it.

Most significant of all, the entire industry fought for a plan which would stimulate competition in developing technological improvements and in giving better service to consumers. Oil men are funny that way.

THIS WEEK

MATERIALS—NPA grants all industry priority rating to procure equipment and supplies for repair, maintenance, and operation of present facilities. . . . ¶PAD order calling for allocation of TEL supplies to refiners is issued. . . . ¶Functions, responsibilities of Defense Production Administration set down by Administrator W. H. Harrison. . . . ¶New orders for control of materials issued by NPA.

TIDELANDS—Spokesmen for three states whose submerged lands were turned over to federal Government by Supreme Court oppose O'Mahoney legislation for operation of tidelands on grounds "interim" legislation may become permanent. . . . ¶Former Interior Secretary Harold Ickes says whole tidelands situation "is as obscure and messed up an issue" as he has ever seen. . . .

WASHINGTON—Secretary of State Acheson objects to limitations of reciprocal-trade agreement tacked on by House, calling one amendment "unworkable." . . . ¶Government to embark on production of new-type synthetic rubber. . . .

INDUSTRY—Report on smog conditions on West Coast reveals refineries contribute only small part to cause. . . . ¶Standard Oil (Ohio) planning to spend $40,000,000 this year on modernization, expansion of production, transportation, refining facilities. . . . ¶N.G.A.A. group studies maintenance and operation of natural-gasoline-plant equipment at Permian basin meeting. . . .

PRODUCTION—New kickoff bomb undergoing tests in West Texas features disintegrating-chemical-bomb method. . . . ¶Water flooding, reservoir engineering, operational subjects highlight St. Louis meeting of A.I.M.E. . . . ¶Chacahoula field in Lafourche Parish, Louisiana, gets new pay zone. . . . ¶Ten rigs at work developing deep field near Castaic Junction north of Los Angeles. . . . Five wildcats under way within a 3-mile radius. . . . ¶Louisiana allowable set at 637,513 bbl. daily for March. . . . ¶Arkansas governor signs new unitization law. . . .

***HIGHLIGHTED.**—Safety flares highlight pressure-storage spheres in this night view at the Cities Service Lake Charles refinery, and the scene highlights the current importance of the lighter petroleum fractions for production of high-octane gasoline and petrochemicals for explosives, plastics, and many other needs of national defense.*

NATURAL GAS—Opposition to state-fixed minimum price for natural gas developing in Texas. . . . Main objection is alleged violation of principle of free enterprise. . . . ¶Kansas Corporation Commission orders distribution of $7,500,000 in impounded funds to royalty holders, landowners in Kansas' Hugoton gas field. . . .

TECHNOLOGY—Modern techniques of combating corrosion studied by pipeliners in Tulsa. . . . Group estimates methods are achieving greater saving in pipelining, but are so unspectacular that their value may be overlooked unless results are contrasted with experience on unprotected older lines. . . .

ACTIVITY—Crude production for week ended February 24 averaged 5,855,325 bbl. daily, up 5,150 bbl. daily for the week. . . . ¶Total completions increased 61 wells to 664. . . . Wildcat completions totaled 130 compared with 121 for previous week and 120 for same week last year. . . . ¶Rotary rigs operating in the United States on February 19 totaled 2,073, down 32 rigs for the week but up 192 rigs for some date in 1950. . . .

TRENDS—Indicated refinery demand for the four major products in 4-week period ended February 17 was about 15 per cent greater than in same period last year. . . . ¶Gasoline demand was up 16 per cent. . . . ¶Middle-distillate demand increased 29 per cent. . . . ¶Deliveries of domestic residual decreased about 40,000 bbl. daily but imports were up about 100,000 bbl. daily. . . .

INTERNATIONAL—Journal to sponsor packaged flight tours to Third World Petroleum Congress in the Netherlands May 28-June 6. . . . ¶Antwerp refinery, now in final phases of postwar-expansion program, to process Middle East crudes. . . . ¶Oil industry hopes for settlement of labor difficulties in Venezuela. . . . ¶Brazilian oil discovery in Bahia area makes 1,000 bbl. daily. . . . ¶Standard-Vacuum to erect new refinery in South Africa.

REFINING—First Platforming unit in East to go on stream soon at Kendall Refining Co.'s Bradford, Pa., refinery. . . . ¶Negotiations under way which will give Mayfair Minerals a half interest in Taylor Refining Co.'s Port Isabel, Tex., refinery. . . .

"MRO" Program

NPA grants all industry priority rating to procure equipment, supplies for maintenance, repair, operation

Bertram F. Linz

WASHINGTON.—The National Production Authority this week granted all industry a priority rating to procure equipment and supplies for maintenance, repair, and operation of existing facilities.

So far as the oil industry is concerned this week's order affords merely an interim method of securing MRO supplies since NPA plans to issue an additional order specifically covering the industry within a few days.

Using a DO-97 rating, refiners and producers may make MRO purchases each quarter to the extent of one-fourth of their dollar purchases for similar purposes in 1950. Small businesses may use the rating for purchases up to $1,000 a quarter without regard to the quota restrictions. Where the quota is too small to provide sufficient supplies, application may be made for an increase.

Not compulsory.—Use of the rating is not compulsory, but if once used MRO purchases must thereafter be limited in accordance with the regulation. In all cases where ratings are used, the firm will be required to charge against its MRO quota any purchases made without use of the rating.

Announcing NPA's intention to keep all businesses running, Administrator Manly Fleischmann declared, "We cannot let the need for materials and equipment to build new facilities interfere with the maintenance of existing capacity. We can afford a few pounds of metal today to keep a machine running rather than several tons tomorrow to make a replacement machine, and this way we avoid the loss of production and employment that would result if we allowed our present equipment to fall into disrepair.

To ease PAD.—The MRO order (Regulation 4) will ease the work of the Petroleum Administration, which for the past several months has been attempting by informal means to assist operators and refiners to get supplies they could not secure through their normal channels.

The Office of Price Stabilization also may move this week to get out a series of orders for control of oil-industry prices. Five separate orders are being perfected, and the next step will be to lay them before industry committees for approval. Eight such committees are expected to be set up, each representing a different segment of the industry or different geographic area, together with a big all-industry committee.

Further sharp cuts in materials for nondefense industries were forecast last week by NPA Administrator Fleischmann and the coming month will see the issuance of a number of orders restricting civilian production during the second quarter.

Basic materials.—Basic materials such as steel, copper, and aluminum will not be available in sufficient amounts for direct defense and defense-supporting activities if consumption is permitted to continue at present levels for nondefense purposes, Fleischmann explaihed. The impact of military requirements on the materials supply is growing increasingly heavy, he said, and in addition, special programs for the provision of critical materials for highly essential needs, such as oil exploration and refining and all forms of transportation, will require increasing amounts.

Fleischmann said that second-quarter requirements for finished-steel products alone will exceed 5,000,000 tons, or about 28 per cent of the available supply, and the projected MRO program will require another 1,000,000 tons. In some items, such as steel plate, defense, and related programs will take as high as 60 per cent of the total supply.

Estimates.—Present estimates of defense-program requirements will necessitate continuation through the second quarter of the March limitation on consumption of aluminum to 65 per cent of the average use in the first half of 1950, the NPA head said. Consumption of copper will be further cut from 80 per cent for March to 75 per cent, and restrictions against the use of copper and aluminum in less essential items and for nonfunctional purposes will be continued.

In addition, the limitations on the amount of steel, copper, and aluminum permitted to be used in consumer durable goods is expected to be cut progressively, to 80 per cent for April, 75 per cent for May, and 65 per cent for June.

DPA Functions

William H. Harrison, administrator, explains duties of agency in coordinating procedure for defense production

WASHINGTON. — Functions of the Defense Production Administration were spelled out last week by Administrator William H. Harrison, who is responsible for the direction and coordination of the plans, procedures, and methods of the departments and agencies having defense-production responsibilities.

A deputy administrator for staff services, Edwin T. Gibson, will determine the adequacy of procedures and methods followed by agencies responsible to DPA for accomplishing the objectives of the defense-production program and will be responsible, directly or through appropriate agencies, for providing facilities and materials to insure fulfillment of procurement objectives; authorizing the installation of government-owned equipment in privately-owned plants; authorizing the expansion or improvement of government plants; providing for loans to private business for the expansion of productive capacity, the development of technological processes or the production of essential materials; authorizing special tax amortization of emergency facilities; and purchase of raw materials.

Central director.—The director of program and requirements, Charles Wampler, will be responsible for central programing to determine the requirements and resources necessary to meet defense-production needs; evaluation of proposals and programs related to the allocation of resources; planning for increased resources; programing of materials and facilities; designation and preventing of hoarding of scarce materials; determination of the relative priority of programs and contracts; and assembling estimated labor requirements of projected programs.

Assistants.—To assist the administrator, four committees have been established, an interagency production-executive committee to provide over-all coordination and direction of production objectives; an interagency procurement-policy committee to evaluate the over-all procurement program and review contract and negotiation practices to insure uniformity; a resources-expansion committee to initiate, coordinate, and assist in establishing expansion objectives and implementing programs to increase productive resources, and a small-business committee.

XUM

Tidelands Opposition

Three states oppose O'Mahoney resolution for tidelands interim management for fear law might become permanent

WASHINGTON.—Spokesmen for three states—California, Texas, and Louisiana—whose submerged oil lands were turned over to the federal Government by the Supreme Court opposed the O'Mahoney resolution for interim management of the tidelands last week on the ground of fear that the legislation might become permanent.

Testifying before the Senate Interior Committee, but from another angle, former Secretary of the Interior Harold L. Ickes summed up the opposition succinctly when he told Chairman Joseph F. O'Mahoney, of Wyoming, that the measure "is no more interim than the 'interim' buildings put up in the first World War." Ickes had reference to temporary structures built in 1917-18 to house the war agencies, which were supposed to be razed at the end of the war but are still standing.

California united.—California officials on the whole were united in opposition to the resolution, but City Attorney Irving W. Smith of Long Beach indicated that from the city's standpoint he had no objection to it if the rights of Long Beach in the area it claims were safeguarded.

Smith was told by O'Mahoney that he did not believe the line of demarcation between inland waters and open sea drawn by the Justice Department was far enough out, and Smith told the senator it would be fine if he could translate his views into concrete action.

Louisiana's contention.—Leander H. Perez, special counsel for Louisiana, submitted copies of the treaty of peace under which England acknowledged the independence of the 13 colonies each by name, to support his contention that the tidelands were the property of the states and not the federal Government.

Louisiana, which has another petition for rehearing pending before the Supreme Court, contends that the decree of last June 5 constitutes confiscation of the states' property without constitutional right.

Perez told the committee the only interim legislation Louisiana would accept would be limited to simple recognition "of state leases, period," and if the legislation gave the Secretary of the Interior the right to make leases for a period of 5 years or as long thereafter as there is production it would not be an interim measure.

"Supercourt."—Still retaining the acidity for which he was famous during his years as a New Deal official, Ickes opened up on the committee by saying the hearing was "an historic occasion—the meeting of the super Supreme Court of the United States."

"I have had certain theories about the use to which these offshore oil lands ought to be put; they ought to be devoted to the public interest," Ickes said.

The former Roosevelt cabinet member explained that when he took over the Interior Department he "inherited" policies of his predecessors, including the view that the tidelands were state property but later became doubtful and urged the President to have the Department of Justice get a ruling from the Supreme Court.

Ickes asserted that the Federal Leasing Act of 1920 "did and does" apply to the offshore lands, and said that, in holding otherwise, Solicitor Mastin G. White of the Interior Department and former Atty. Gen. Tom C. Clark "were derelict in their duty." He declared, too, that the stipulation entered into between the Department of Justice and California "constitutes nothing less than a contempt of the Supreme Court."

All a mess.—"So far as the tidelands situation is concerned," Ickes said, "the whole thing is as obscure and messed up an issue as I have ever seen."

The former secretary, who declared that all applicants for federal leases in the tidelands prior to 1936 have a "vested right," told the committee the present state lessees are "merely trespassers" and in dealing with them "we kiss them on both cheeks and give them a new lease on life."

Reverting repeatedly to his efforts to get the tidelands issue into the courts, Ickes said he always had doubted whether the Department of Justice wanted to win the California case.

Wheeler appears.—Former Sen. Burton K. Wheeler of Montana also appeared before the committee in behalf of 13 clients who applied for federal permits on California lands prior to June 1935 and thereby, he said, acquired a vested right under the August 21, 1935, amendment of the Leasing Act directing the issuance of permits to qualified applicants who had filed 90 days prior to that date.

Wheeler charged that the lands which his clients sought have been granted to the Southwest Exploration Co. and Signal Oil & Gas Co. A suit to test their claims is pending in the District of Columbia court, where it was argued January 23.

An amendment which would protect the rights of these applicants was urged by Wheeler, and Sen. James E. Murray of Montana submitted amendments which would carry out Wheeler's ideas.

Storage Tank—Not Pillow

This 10,000-gal. collapsible container for storing petroleum products was designed for the Army to be put in use quickly and easily in forward battle areas, during landing operations, and at truck-fill stands and pump stations. Developed by army engineers and produced by Goodyear Tire & Rubber Co., the "pillow" is made of alternate layers of Buna N synthetic rubber and nylon cloth with a coating of liquid nylon to prevent porosity. Transported in a protective box, it is installed simply by unrolling like a rug. The single 4-in. opening at left is both inlet and outlet. The small opening in the middle of the container is an overflow valve. Industry uses suggested for the product may be as a breather for gasoline-storage tanks or immediate storage where needed.

WATCHING WASHINGTON

Bertram F. Linz

Tidelands Quandary

The determined opposition of California and Louisiana to any legislation that would give the federal Government even temporary control of their tidelands oil may result in the shelving, temporarily at least, of the O'Mahoney resolution for interim management by the Interior Department, to give opportunity for action on quitclaim legislation.

O'Mahoney, who presided over the hearings by his interior affairs committee, indicated that he was disgusted with the whole thing, feeling he isn't getting any cooperation in his attempt to clear the situation up so that development can go ahead.

A committee vote when the hearings closed would have been close, and the resolution is seen as losing ground as time goes on although it probably could be reported out by a one or two vote margin.

O'Mahoney has indicated doubt that a quitclaim bill could be enacted over a presidential veto but is getting to the point where he might be willing to have a showdown. If the legislation was passed over the opposition of administration, that would end the whole controversy, while if a veto held up it would make easy the passage of at least the interim legislation at which the senator aims.

Oil in an Emergency

Oil needs of the present defense program can be met without marked modification of product characteristics, but Petroleum Administration officials see the possibility of substantial degradation of both quantity and quality of civilian fuels in the event of an all-out emergency.

Even though we may not have an appreciably greater air force in terms of men and planes the next war will see military demand for aviation fuels considerably heavier than that of the last war, in part because planes are larger and fly longer missions and in part because jet engines burn three times as much fuel as do reciprocating engines.

The limitations on the quantity and quality of civilian supplies will be caused by the requirements for jet fuel which would take a substantial portion of components that normally go into kerosine, heating oils, and diesel fuels.

The deterioration of quality, according to Thomas L. Apjohn, assistant director of the PAD refining division, would most seriously affect the railroads. Diesel-fuel consumption has increased fourfold in the past decade and is expected to become five times as much by 1953 as it was in 1940. The effects of lower quality can be offset to a considerable extent by the use of detergent additives, but the supply of these may be limited since most of them are metal sulfonates requiring alloys which are among the tightest of construction materials, as well as sulfur, which is among the tightest of basic chemical materials.

Male Shortage

The Bureau of Labor Statistics has been digging into the manpower situation and has come up with some interesting facts, among them that the low birth rate of the depression era will limit additions to the labor and military forces for some years to come.

The bureau found that while the total population has increased more than 20,000,000 in the last decade, the number of males now reaching the age of 18 is almost one-fifth lower than in 1940 and will not reach the 1940 level until 1958.

It also found that under emergency conditions about 5,000,000 additional persons could be added to the total labor force, and about 40 per cent of the 1,710,000 men in "critical" skilled or professional occupations are in the age group 19-34, but they constitute only about 4 per cent of the total male population in that group.

Free Pocket Money

If any one wants to make a little pocket money, the State of Georgia is still offering $100,000 for the first commercial oil well, and what is more, the state oil and gas commission, created in 1945, is confident that it will eventually have to pay out the money.

The commission sent in a report last week showing that in the past 5 years 24 exploratory wells have been drilled in 17 counties, 1 to a depth of 7,320 ft., but no effort has yet been made to test the 18,000 or 20,000 ft. of Paleozoic rock which underlies sections of the state where officials believe the chances of oil discoveries are best.

The Georgia coastal plain, which comprises 60 per cent of the state, is underlain by a thick series of Mesozoic and Cenozoic rocks, which includes all of the Mesozoic system.

Trade Agreement

Limitations by House are objected to by Acheson

WASHINGTON. — The Truman administration launched a campaign last week for elimination by the Senate of the limitations imposed by the House on the President's authority to make reciprocal-trade agreements *(The Oil and Gas Journal, February 15, 1951, page 58)*.

Testifying as the first witness at hearings before the Senate finance committee, Secretary of State Dean Acheson urged that Congress "not cripple" the administration in its efforts to expand world trade.

Acheson asserted it has been the constant objective of the administration "to take the utmost care to see that no domestic industry or branch of labor or agriculture was injured" by reciprocal-trade agreements and "these objectives have been accomplished." But he said immediately that "some mistakes" probably have been made.

Unworkable.—The House amendment requiring the Tariff Commission to determine the point below which a duty could not be reached without imperiling domestic industry would be unworkable, Acheson said, because of the extreme difficulty of fixing the precise point at which injury will be caused.

Another amendment which would require the commission to make an investigation on every application appeared, however, to be Acheson's major target.

Declaring that this procedure could be invoked on the most flimsy excuse, the secretary said injury to only a segment of an industry, no matter how marginal, would be sufficient to invoke the clause and withdraw a concession, and the amendment "would make any decline in sales, or increase in inventory, or any downward trend in production, employment and wages, regardless of cause, evidence of serious injury if import competition contributed to it in any way."

Unnecessary.—"These amendments are unnecessary because of the care with which possible concessions and their probable effects are studied under existing procedures before recommendations are made to the President and because an adequate escape clause is now included in the great majority of our trade agreements," Acheson said. "They are undesirable and the second is unworkable in its present form."

Acheson also objected to the House amendment denying tariff-concession benefits to Communist countries, saying that the objective is laudable but such action would give good ammunition to Soviet propagandists.

XUM

Tubular Goods

Supply houses to stock pipe for wildcatting

WASHINGTON. — An oil-country-goods warehouse-industry advisory committee met this week with officials of the National Production Authority and Petroleum Administration for discussion of measures to assure adequate supplies of tubular goods for emergency situations.

The committee agreed that PAD's plan to set up an emergency reserve of casing, drill pipe, and well tubing of 5 per cent of total production, to be held in warehouse stocks for emergency or wildcat situations, would meet this need.

To put the plan into effect, warehouses in 13 oil-producing areas will be designated to hold the reserve supplies, and in each area one or more equipment suppliers will be appointed to retain the reserve. The program for the percentage determination and location of the reserve warehouses will be worked out by NPA and PAD.

Industry representatives attending the meeting included:

David S. Bovaird, Bovaird Supply Co., Tulsa; Jerry Vinson, Industrial Supply Co., Wichita Falls, Tex.; Sol Brachman, Producers Supply & Tool Co., Fort Worth; J. H. Loller, Jr., Republic Supply Co., Houston; J. L. Shakely, Jones & Laughlin Supply Co., Tulsa; Frank Hereford, Murray Brooks, Inc., Lake Charles, La.; K. W. Davis, Mid-Continent Supply Co., Fort Worth; Fred F. Murray, Oilwell Supply Co., Dallas; H. Bernard Wahrle, McJunkin Supply Co., Charleston, W. Va.; A. W. McKinney, National Supply Co., Toledo; and H. B. Gutelius, United Supply & Manufacturing Co., Tulsa.

NPA Issues Control Orders

WASHINGTON.—The National Production Authority has issued the following new control orders for various materials:

Amendment to Order M-4, February 19: Increasing allowable expenditures for alterations and additions to office and loft buildings and hotels.

Supplement 1 to Order M-2, February 19: Prohibiting the manufacture of white-sidewall automobile tires and reducing the number of types and styles of tires, inner tubes, and industrial-rubber goods.

Amendment to Order M-29, February 19: Permitting individual owners of deerskins to have them tanned for personal use.

Amendment to Order M-12, February 19: Revising the basic copper-conservation order to permit the use of copper held in inventory after March 1.

Amendment to Order M-7, February 21: Providing for gradual elimination of the manufacture of aluminum windows and air ducts.

Amendment to Order M-25, February 23: Permitting the use of tin in cans for packing some products previously prohibited.

Chemicals Authority Set

WASHINGTON.—Authority over the production and distribution of industrial chemicals used principally in the petroleum industry was delegated to the Secretary of the Interior February 27 by the National Production Authority.

The delegation was in conformity with an agreement reached January 17 under which NPA promised to make a formal delegation to PAD of control of chemicals chiefly of importance to the oil industry.

Products which thus go to PAD are tetraethyl-lead fluid, petroleum-cracking catalysts, special inhibitors used in gasoline, lubricating-oil additives, and fluids and additives made especially for oil and gas drilling and emulsifiers.

TEL Order

Petroleum Administration sets up allocation system

WASHINGTON.—The Petroleum Administration issued its first formal order February 27, establishing an allocation system for tetraethyl lead.

Under the order refiners who used more than 1 million pounds of TEL for motor gasolines during 1950 will be restricted during the 12 months period beginning March 1, to a base allotment of 1 million pounds, plus 80 per cent of their 1950 consumption in excess of the base allotment. Refiners who used 1 million pounds or less will be allowed the full amount of their 1950 consumption.

The order also prohibits refiners from using more than 30 per cent of their annual allocation during any one quarter of the 12 months period.

Hardship cases.—Provision is made for hardship cases, permitting any person affected to request an adjustment or exception on the grounds that "his operations were commenced, increased, or altered during or after the base period or that any provision works an undue hardship upon him not suffered generally by his competitors or others in the same trade or industry."

PAD officials said that of the 220 purchases of tetraethyl lead, 166 used less than 1 million pounds during 1950 and so will be allowed as much of the fluid during the next 12 months as they consumed last year. The other 54 purchasers, who consumed 91 per cent of the TEL used in motor fuel during 1950, will receive amounts ranging from approximately 81 to 99 per cent of their 1950 consumption.

Control needed.—Deputy Administrator Bruce K. Brown said additional production and storage facilities of TEL are now under construction but the allocation control is needed to overcome existing shortages and permit accumulation of inventories to meet future eventualities.

Under the order refiners are permitted to use their allocation of TEL in such way as they deem best. PAD said, however, that if they chose to apply the cutback equally over all gasoline produced, the result would probably be to lower the octane rating of motor gasoline by an average of from 1 to 1½ octane numbers on a nation-wide basis.

OIT Forms New Division

WASHINGTON.—With foreign-oil operations again having to be tied in with domestic requirements because of the defense program and the shortage of materials, the Office of International Trade last week set up a special petroleum division to handle the licensing of petroleum products and oil development projects formerly performed in the materials division and projects division.

The new division will be directed by Lester M. Carson, formerly acting director of the interagency division of the National Production Authority. During the war, Carson served with the petroleum division of the Foreign Economic Administration and afterwards directed the petroleum, fuels, and energy division of the Department of Commerce. Prior to entering government service he was associated for 25 years with the oil industry here and abroad.

Senate O.K.'s Renegotiation

WASHINGTON.—The Senate last week approved a renegotiation act with provisions for the treatment of oil patterned along the wartime legislation.

The Senate provisions, much broader than those written by the House, which previously had passed the bill, will necessitate the appointment of a conference committee to work out the differences between the two bodies.

Under the Senate bill, any contract or subcontract for the product of an oil or gas well which has not been refined beyond "the first form or state suitable for industrial use" would be exempt from renegotiation. Under this provision, natural gasoline, a byproduct resulting from the processing of natural gas, would not be subject to renegotiation. This exemption is broader than that provided in the House, which limited the exemption to the product of the producer.

California Hot Spot

Wildcatting activity increasing in Castaic Junction area; five tests are under way within a radius of 3 miles

D. H. Stormont

LOS ANGELES.—At Castaic Junction, on the Ridge Route about 35 miles north of here, Tips Restaurant long has been a favorite breakfasting stop for the oil fraternity on early morning trips to San Joaquin or Cuyama Valley. Of late, more and more have been taking lunches and dinners there too.

This stepup in Tips' oil-field trade is explained by increased wildcatting activity for which the Junction is more or less the center. Within a radius of 3 miles, five wildcats are drilling or soon will get under way; within about 7 miles a total of eight tests are drilling or have been staked. Several of these are slated to go to 12,000 ft. or deeper. In addition, in nearby fields there are about 10 rigs at work.

1950 Discoveries. — The exploratory activity is primarily the result of two 1950 discoveries; Honor Rancho, a little over 1 mile north, and Castaic Junction field 1½ miles to the southwest. In the former The Texas Co., which discovered the field, is drilling its third well.

One-half mile west, in 1-4n-17w, Humble Oil & Refining Co. and British American Oil Co. at the weekend were drilling below 9,000 ft. on an attempted extensioner. The test, 1-C Newhall Land & Farming Co., found water in both the 5,300-ft. and 6,400-ft. sands which produce in Honor Rancho. About 2½ miles southeast of the field, in 9-4n-16w, Humble has staked location for its No. 1-D Newhall Land.

Midway between the two new fields, in 12-4n-17w, Humble No. 1-B Newhall Land reportedly has found nothing of much importance above 11,000 ft. The wildcat at the weekend was slightly below 11,000 ft. in a Mohnian shale, and had been in shales for the last 1,000 ft.

Extension sought. — At the Castaic Junction field, where Humble, the discoverer, has three deep producers, the company is seeking to extend productive limits ¾ mile eastward. Humble has released no information on whether the extensioner, No. 4 Newhall Land, would make a well in the shallower 9,800-ft. sand, but scout reports indicate it is an almost assured producer. A late report on the well placed it as coring in a tight oil sand at 10,423 ft.

Discovery well.—The field's discovery was a 160-bbl., 38°-gravity producer from a 65-ft. net Mohnian sand above 11,840 ft. The second well, drilled 2,900 ft. to the northeast, produced 155 bbl. of condensate through perforations between 11,200 and 11,370 ft. It was completed in what is thought to be the equivalent gas-condensate zone of the discovery well, with the corresponding oil zone absent due to higher structural position of the second well. The third opened a new Mohnian sand between 9,745 and 9,880 ft.

The field is located on the southeastwardly plunging nose of the Del Valle anticline. Geologic data, however, suggests that faulting may separate Castaic Junction from Del Valle production.

12,000-ft. test. — In 29-4n-16w, about 1½ miles southeast of the Humble stepout, General Exploration Co. has staked location for a 12,000-ft. test. In Section 23, near Saugus, Superior Oil Co. is below 8,500 ft. at its No. 1 Bonelli and reportedly has not encountered anything important. In the same section The Texas Co. has spudded a joint venture with Bolsa Chica Oil Co.

Northwest of the junction about 7 miles, Trigood Oil Co. is seeking production about 1 mile north of the Oak Canyon field. This test, No. 1 Ayala, has reached a depth of about 5,000 ft. North of the junction about 8 miles, Texaco has its No. 1 Daries under way in 2-5n-17w.

Smog Report

Refineries contribute only small part to cause

LOS ANGELES.—For the past several years most residents have pointed to refineries in the vicinity of Los Angeles as being the major cause of the city's smog problem. It turns out now that all along the accusers themselves have been the worst offenders.

This conclusion was announced here last week by Stanford Research Institute on completion of a yearlong survey sponsored by the Western Oil and Gas Association. The survey, undertaken to determine sources of combustion products and measure their important chemical constituents, added specific data to earlier general findings.

Burning by the public and industry of nearly 50,000 tons per day of fuels and rubbish is thought to result in at least 2,280 tons of chemicals being emitted into the atmosphere. Of this total 60 per cent is believed to come from activities of the general public, such as driving automobiles and buses, burning garden trash, and heating homes, stores, and office buildings. All industries in the county account for the remaining 40 per cent.

Organic sources.—Almost two-thirds of the chemicals entering the air are organic in nature, Institute scientists said, and 76 per cent of these organic chemicals are produced by activities of the general public. Household burning of 4,000 tons of trash, the biggest single source, alone sends 550 tons of these organic materials into the air every 24 hours.

Exhaust fumes from the approximately 2,000,000 automobiles, buses and trucks operated daily in Los Angeles County which drive an average of 50,000,000 miles per day contribute another 350 tons of organic substances as well as 30 tons of eye-irritating aldehydes and 40 tons of nitrogen oxides. The latter chemicals, as oxidizing substances, were described as important reactants for further combinations in the atmosphere.

Exhausts.—Much of the organic material in automobile exhausts consists of unburned and partially burned gasoline, it was disclosed, and approximately an equal amount of gasoline vapors — 400 tons — escapes by evaporation. Of this latter total, it is estimated that about 250 tons are lost from refinery operations while 150 tons are lost from automobile gas tanks and service stations.

HAZY DAY.—Los Angeles buildings viewed from about one block away at approximately 11:30 a.m. on a smoggy day earlier this month. Visibility at noon was officially announced at ⅛ mile, which was one of three noons since 1937 when it was so low.

Corrosion Study

Tulsa short course for pipe liners devoted to discussion of cathodic protection, other modern anticorrosion techniques

Paul Reed

MODERN techniques of combating corrosion are achieving the greatest saving in pipelining today but are so unspectacular that their value may be overlooked unless results are contrasted with experience on unprotected older lines which frequently have several leaks a day costing from $750 to $1,000 a leak.

This estimate of mitigation methods which have proved themselves in recent years was brought out of the Second Annual Tulsa Short Course for Pipeliners February 21-23, which included both instruction in the practical control of pipe-line corrosion and open discussion of the significance of new developments.

Basic principles and techniques of instruments, coatings, and cathodic protection were presented by members of the Tulsa section of the National Association of Corrosion Engineers in lectures, symposiums, and field demonstrations. The program, planned primarily for the benefit of men directly concerned with field operations of maintenance and construction inspection, was attended by more than 200 foremen, superintendents, engineers, and suppliers from organizations throughout the United States and some foreign countries.

Cathodic protection.—Cathodic protection received a prominent spot on the program because of its significant function, and all known forms of underground corrosion can be mitigated by this method. Coatings are now evaluated in terms of their effectiveness in reducing the cost of current requirements for future cathodic protection, and the process is becoming the criterion in corrosion-mitigation programs. Instructors in the short course cited that corrosion-mitigation economics now indicate that good single coating and wrapping applications are giving sufficient service where cathodic protection is applied.

Some earlier misconceptions have been expensive. For example, severe pitting of coated sections of reconditioned lines has been erroneously blamed on damage inflicted by the coatings; this pitting could have been checked by cathodic protection. Likewise, the excessive pitting of new lines laid parallel to old lines was not due to inferiority of new pipe but to "dissimilar metal corrosion" where new pipe was being sacrificed for older lines. Here again is a situation which is readily corrected by cathodic protection.

Coating trend.—An important trend in coating practice in the past year has been the increased use of new types of intermediate coatings suitable for application in zero weather and in normal ranges of temperature throughout a large part of the pipeline country of the United States. Pipe coatings usually cost about 10 to 12 per cent of the investment in large diameter pipe.

In rectifier ground-bed installations there has been a trend to the use of graphite and carbon to obtain longer service. Extensive rectified installations continue to be made for situations with relatively large current requirements, particularly where purchased power is available.

Galvanic anodes.—The rapid increase in the use of galvanic anodes, especially of the magnesium type, has been spectacular in the last 2 years in the United States when the advantages of large-scale anode installations have been demonstrated. Since these anodes are cheap and since anodes are independent power plants, they may be distributed in flexible programs applicable even in the remotest areas.

Savings.—Savings achieved by magnesium anodes are convincing. One large crude-oil system with thousands of miles of old bare pipe has an average of at least seven new leaks per day. In 1949 it was estimated that 3,000 leaks on the system cost $2,250,000. Within 2 years, 40,000 magnesium anodes costing about $510,000 were installed. Last year there were 400 less leaks and a reduction in leak cost of $300,000. The anodes will probably continue to serve for another 6 to 8 years.

Objections raised.—Strong objection was expressed, in open discussion, to conductance-test requirements for contractors—an innovation introduced to the industry on a recent project. In defending these tests it was explained that they are really mild attempts to uncover serious bare spots rather than minor flaws in coating application and subsequent handling of coated pipe during lowering-in and backfilling. Objectors, on the other hand, insisted that conductance tests would induce contractors to bid higher to such an extent that the economic advantage of coatings would be impaired.

Differential aeration.—Differential aeration was stressed, in discussion of basic principles, as perhaps the major cause of pipe-line corrosion. Need for adequate insulation at road crossings was emphasized.

Surface potential surveys are being used more widely as convenient means for locating pipe-line corrosion.

While the pipe-line industry is decentralizing much cathodic-protection work to district field personnel, it

Instructors, directors, and corrosion engineers who participated in the Tulsa Short Course for Pipeliners. Seated, left to right: J. N. Hunter, Jr., Service Pipe Line Co., chairman; L. A. Hugo, Phillips Pipe Line Co.; and T. D. Williamson, Jr., T. D. Williamson, Inc. Standing, left to right: L. B. Nelson, Shell Pipe Line Corp.; Robert L. Bullock, Interstate Oil Pipe Line Co.; L. F. Heverly, Great Lakes Pipe Line Co.; J. R. Cowles, Oklahoma Natural Gas Co.; and Hugh A. Brady, Gulf Refining Co. Instructors and directors not pictured included Yale W. Titterington, Dowell Incorporated; F. E. McNulty, Pittsburgh Coke & Chemical Co.; and Maynard H. Jackson, Middle West Coating & Supply Co.

J. R. Cowles, Oklahoma Natural Gas Co., conducts a field demonstration for short-course class on the use of a high-resistance voltmeter and a potentiometer volt meter for surface potential surveys. These are being applied to an increasing extent in the industry for determining location of pipe-line corrosion. Instrument readings were recorded on paper strips on the ground for the convenience of the class.

continues to be apparent that the solution of cathodic-protection problems requires the detailed analysis of corrosion engineers. Incorrect solutions can easily be more expensive than the original corrosion damage. The judgment of corrosion engineers is essential in dealing with problems of interference involving foreign lines and other structures. Furthermore, professional fairness is vital in the successful application of measures for the mutual protection of facilities owned by different organizations.

New Kickoff Bomb

Disintegrating-chemical-bomb method of kicking off dead wells undergoing experimental work in West Texas

Roy F. Carlson

MIDLAND, Tex. — A new disintegrating-chemical-bomb method of kicking off dead wells is undergoing experimental work in some of the lower-pressure pools of West Texas. As now envisioned, the bomb will consist only of oil soluble or low-melting-point materials and gas-producing chemicals, all of which will be carried from the well by produced oil.

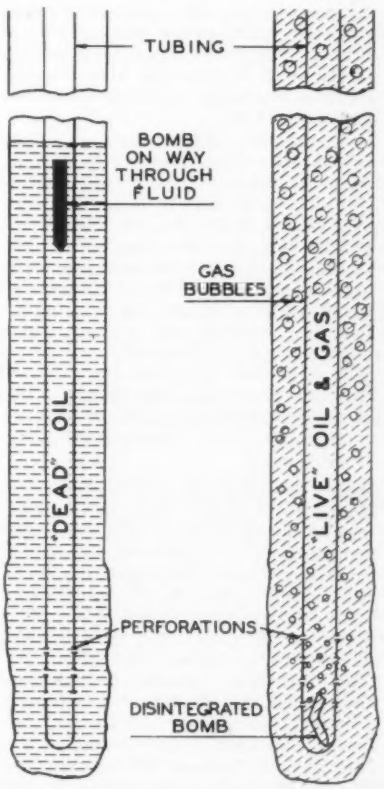
In almost any flowing oil well it is possible to establish conditions of pressure and flow rate at such levels that the well will "die." In a well under these circumstances a column of liquid apparently becomes balanced above a column of gas or against gas in the producing formation with some sort of interface between the two that prevents normal gravity segregation of liquid and gas. The well will arrive at this stable state because of pressure decline, improper flow rate, or because of water entry into a well which requires increased amounts of energy for lifting than is available in the well. Of course some gas will also be in solution.

Must break interface. — In order to start the well flowing after it has achieved this stable state, the interface between gas and liquid must be broken in some manner so that gas can penetrate the liquid column, or come out of solution, lighten it by mixing with it, and lift the oil out of the well by expansion both within and below the liqiud column. This process is known as "kicking the well off."

In many cases, all that is necessary to start the mixing-flowing process is some method of breaking the interface, or breaking out dissolved gas, and this has been done by well switchers for years by dropping some foreign object, such as a nail, spark plug or rock down the tubing. Another method has been to "rock" the well—in wells where there is communication between the tubing and the tubing-casing annulus—by alternately bleeding pressure off the annulus and off the tubing into the annulus. This process raises and lowers the liquid columns in tubing and annulus, helping to mix gas with the liquid and making it light enough to be flowed out of the well by existing bottom-hole energy.

Third method.—Still a third method of starting flow in a well is to swab some of the oil out of the tubing so that part of the liquid column is removed to make the remaining load light enough to be lifted by bottom-hole energy. This swabbing process is made particularly difficult if nails or spark plugs have been previously dropped into the tubing.

The new method of kicking off the well by means of a completely disappearing bomb is undergoing experimental work by members of the Tretolite Co. of St. Louis. Further information about the bomb may be obtained here. The tool, when finally developed, will probably consist of a case made of an oil-soluble or low-melting-point organic compound that will either dissolve or become liquid at bottom-hole temperatures or in the presence of oil. The case will contain two chemicals that are separated in the bomb, but will, upon mixing,



Left diagram shows stable or "dead" well. Diagram at right shows how bomb releases gases, aerating fluid column forcing fluid up tubing.

generate at a rather rapid but far more explosive rate.

Chemicals mix. — When the loaded bomb is dropped into the tubing it will fall to the bottom where the case will melt or dissolve and permit mixing of the two chemicals. The gas that is generated will add to the bottom-hole energy, and will break the gas-liquid interface and start flow in the well. The bomb will probably be made in varying lengths and with varying charges to meet several well-depth and fluid-level conditions. The fact that the bomb passes through or near the gas-liquid interface on its way to the bottom of the tubing will also help in kicking off the well in much the same manner as dropping some solid object into the tubing.

In two parts.—As seen by the experimenters, the bomb will be made in two parts, each holding one of the reacting chemicals, so that the bombs may be safely stored near the place of usage where they would be quickly available. The two-part provision should prevent premature reactions. However, even should this happen, the reaction would not be violent enough to cause damage.

When finally developed this kick-off bomb will aid operators in two ways: First, it will enable a well switcher to kick off a dead well in a minimum of time, saving hours or days of production. Second, it will reduce costs on wells where a swabbing unit has been used when not absolutely necessary. The saving of production might become particularly large if a swabbing unit were not immediately available.

INDUSTRY AFFAIRS

Production Conclave

St. Louis A.I.M.E. meeting is highlighted by water flooding, reservoir engineering, operational subjects

K. B. Barnes

ST. LOUIS.—Water flooding, reservoir engineering, and operational subjects highlighted the petroleum branch program of the American Institute of Mining and Metallurgical Engineers annual meeting held here February 17-22.

The Benton, Ill., properties of Shell Oil Co. were described as having their oil production boosted from a low of 730 bbl. daily during December 1949 to a rate of 3,250 bbl. per day at the end of 1950. Schlumberger Well Surveying Corp. told of a new resistivity logging method, the "Laterolog," which incorporates an automatic focussing system to achieve sharp differentiation. Research work of Stanolind Oil & Gas Co. showed check tests of good agreement could be made as between gravity drainage experiments and theoretical calculations.

Water flooding.—Shell's Benton water flood in Franklin County, Illinois, was discussed by C. V. Cameron. The operation is a fully unitized project covering about 1,900 productive acres, and water is injected into the Tar Springs sandstone reservoir at a depth of 2,100 ft. The project was started in November 1949.

The general aspects, engineering, and operational details of the formation of the Salem Unit of Lake Centralia-Salem field, Illinois, was described by Richard W. Love of The Texas Co. The unit represents the result of 2 years' work on the part of 28 operators along with the concurrence of approximately 1,950 royalty owners.

There are 50 water-flood operations in Illinois. Approximately 20,000 productive acres are being directly affected by systematic water flooding and 15,000 productive acres are being affected by McClosky dump flooding. The water flood acreage is approximately 8 per cent of the total productive acreage in Illinois.

For the systematic water floods, current daily water injection is 140,000 bbl. and the current daily waterflood oil production is 15,000 bbl. H. S. Barger, Evansville, Ind., consultant; and J. H. Campbell, of Lewis Engineering, Inc., Evansville, in their paper "Water Flooding in Illinois Yesterday, Today, and Tomorrow," estimated that as of Januarly 1, 1951, the cumulative water-flood oil production has totaled 19,000,000 bbl. and that the cumulative water injection is approximately 105,000,000 bbl. This gives an over-all water-injected produced-oil ratio of 5.5 to 1.

"Laterolog."—A new method for the measurement of resistivity in bore holes was described by H. G. Doll, director of research for Schlumberger. It involves a controlled focussing system of electrodes, whereby the current used for the measurement is obliged to flow within a narrow slice of space, the boundaries of which are substantially horizontal up to a great distance from the bore hole. With the new method, the effect of the mud column, and of the adjacent formations on the value of the apparent resistivity measured opposite a given bed is practically eliminated, where the thickness of the bed is at least equal to the thickness of the sheet of current, (i.e., a few inches to a few feet).

By means of the Laterolog an accurate and detailed delineation of formations is obtained. The new method also gives values of apparent resistivity which are close to the true values, provided the depth of invasion of mud filtrate is not too deep, and provided the resistivity of the invaded zone is not greater than the resistivity of the uncontaminated part of the bed under survey.

Production, drilling papers. — For a system where pressure is maintained above the bubble point, experimental data obtained by P. L. Terwilliger, Howard N. Hall, L. E. Wilsey, P. M. Bridges, and R. A. Morse, all of Stanolind, indicate that from a recovery standpoint there is no particular significance to the "maximum rate of gravity drainage." These men developed refined methods of solution of frontal-drive problems which allow calculations of detailed saturation distribution during replacement. Excellent agreement between experimental and calculated behavior has been obtained. Title of the paper was "An Experimental and Theoretical Investigation of Gravity Drainage Performance."

Formation fractures are frequently the cause of loss of circulation. Those that are created or widened by fluid pressures have been recognized as the most difficult to seal. A study by Stanolind of the variables which are related to fracturing developed the belief that the presence of an effective lost-circulation material in the mud stream serve to plug small fractures at the moment of their occurrence and thereby prevent fluid pressures from widening and extending the fractures and causing lost circulation. In the work covered by the paper "An Analysis and the Control of Lost Circulation" by George C. Howard and P. P. Scott, Jr., of Stanolind, a large number of lost-circulation materials were classified and tested in simulated fractures and in shallow wells. A new type of centrifugal sorter also was given preliminary tests by Stanolind and found to be apparently capable of separating lost-circulation materials and cuttings.

Other papers.—Other papers presented were: "Improvement of the Acidizing Process by the Formation of Channels," by P. H. Cardwell, Dowell Incorporated; "Measuring the Water Vapor Content of Gases Dehydrated by Triethylene Glycol," by Irwin Politziner, F. M. Townsend, and L. S. Reid, University of Oklahoma; "Design and Performance of Horizontal Separators for High Rates of Production," by E. J. Lyon and E. Van Dornick, Arabian American Oil Co.; and "A Petroleum Engineering Progress Report on the Scurry County, Texas, Reef Field," by William L. Horner, Sunray Oil Corp., Tulsa.

Sohio Plans Expansion

CLEVELAND.—Standard Oil Co. (Ohio) will spend between $35,000,000 and $40,000,000 during 1951 for modernization and expansion of production, transportation, and refining facilities, Clyde T. Foster, president, announced last week. The exact amount depends on the progress of the national-defense program and the availability of men and materials.

Included in this year's budget are $5,500,000 for new crude-distillation units at the company's Cleveland refinery; $2,000,000 for new terminal facilities at Lima, Toledo, and Columbus; and the continued expenditure of $10,000,000 for additional crude production.

Foster stated that Sohio had made capital investments totaling $100,000,000 over the past 3 years, including extensive new refining facilities at Lima, new catalytic cracking units at Cleveland, and a new pipe line from the Southwest.

SOUTHWEST

N.G.A.A. Meeting

Maintenance and operation of natural-gasoline-plant equipment highlight Permian basin regional gathering

Roy F. Carlson

BIG SPRING, Tex. — Maintenance and operation of natural-gasoline-plant equipment were primary topics of papers presented last week at the first regional meeting of the Natural Gasoline Association of America ever to be held in the Permian basin area. Attendance at this first meeting indicated that it would become an annual affair, and would probably be held in Odessa, Tex., next spring.

The first of the technical papers on operation of compressors suggested that maintenance of machinery be controlled by close checks on performance of the equipment. Repeated overhaul and disassembly of these big machines can often do more harm than good, if such repair work is not necessary. Operation and performance data such as lube-oil consumption, fuel consumption, lubrication, and scavenging pressures, should be kept by maintenance personnel and will indicate when repairs are necessary. The paper was prepared by S. B. Lamb, Cooper-Bessemer Corp., Mount Vernon, Ohio, and was delivered in his absence by J. H. Caldwell, of the same company.

Steam turbines. — A second maintenance paper on the operation of mechanical-drive steam turbines, used widely in gasoline plants, especially for the driving of auxiliary equipment, reviewed the development of the present type of turbine, and illustrated progress that has been made in the design with more and more concentration upon facility in maintenance. The development of the horizontally split case is evidence of this, he said, as is the introduction of turbines for use in exposed positions. Developments in high-pressure high-temperature turbines has also been rapid, he said. This paper was given by Stephen Bencze, of Elliott Co., Jeannette, Pa.

REGIONAL N.G.A.A. OFFICIALS.—Standing, left to right: W. L. Phillips, Phillips Petroleum Co., William Edwards, Odessa Natural Gasoline Co., B. E. Keeling, Vinson Supply Co., all of Odessa, Tex.; N. S. Whitmore, Stanolind Oil & Gas Co., Andrews, Tex., and W. F. Lowe, executive secretary, Natural Gasoline Association of America, Tulsa. Front row, left to right: J. M. Sappington, Barnhart Hydrocarbon Corp., Big Lake, Tex.; E. D. Dickey, Shell Oil Co., Midland, program chairman; H. R. Markley, Phillips Petroleum Co., Odessa, and J. L. Brown, Shell Oil Co., Midland.

Residue gas.—A possibly bright and at least stable future market for residue gas from isolated gasoline plants in the carbon-black industry was predicted by Gordon Kidoo of Barnhart Hydrocarbon Corp., of Big Lake, Tex. The channel-black market, he said, would at least be stable for the future, and he predicted a possible increase in the use of oil black—now about 25 per cent of all black used—and carbon black made in furnace plants. This is indicated, he said, by the planned construction in the industry. The growth in the use of the furnace black, both from oil and from gas, will be initiated by increases in synthetic-rubber production to which the furnace blacks are better adapted. Kidoo pointed out that channel-black plants have the advantage over other methods of producing black because they can be used in isolated and dry areas where water and power are not available in large quantities.

Safety practices.—In a paper prepared by H. W. Boggess of the Sinclair Oil & Gas Co. and delivered by H. H. Myers of that company, the authors stated that safety in a gasoline plant should begin at the drawing board when the plant is just beginning to be developed. Safety should enter into all considerations in design and a continuing educational program should be instituted early in the life of the plant. Due thought should be given at all times to the human element, a consideration that Myers illustrated by reviewing accidents being caused by plant personnel wanting to appear brave.

A second paper on human factors in plant production was "Morale—Its Byproducts and Fractions." The attitude of plant personnel directly affects plant production both in quality and quantity, said Dr. Quentin File, Stanolind Oil & Gas Co., Tulsa, author of the paper. This same morale factor will also influence personnel turnover, help reduce maintenance costs, and help in public relations. High plane morale can be built by education in jobs, education of supervisors, and education of personnel for higher positions. The first thing in morale, File said, is making a man feel that he belongs to the organization.

Product treating.—Possible methods

of gasoline - plant - product treating were outlined by G. M. Brooner, Phillips Petroleum Co. Removal of hydrogen sulfide from liquid products by a caustic wash was described as being the most common with amine solutions coming into use. Free sulfur should be removed, he said, by a caustic-polysulfide wash, and mercaptans by a regenerative-caustic wash or by copper sweetening, or a combination of these.

Stripling speaks.—The more than 270 oil men who attended the meeting gave an ovation to Robert E. Stripling, Midland, Tex., attorney and independent oil man, and former member of the House un-American activities committee, when he suggested that Americans fight communism by returning to being just good Americans rather than internationalists.

Texas Gas Hearing

Blount bill calling for minimum price is opposed

AUSTIN.—Opposition to a state-fixed minimum price for natural gas was due to develop at a hearing before the Texas House committee on oil, gas, and mining this week.

A minimum price at the well head of 10 cents per thousand cubic feet was provided for in two bills, one by Rep. John E. Morrison, Jr., Chillicothe, and the other by Rep. R. E. Blount, Big Spring, which are due to come before the hearing.

The committee was also due to review a second bill by Morrison which would require the Texas Railroad Commission to prorate gas on the same statewide basis as it now does crude oil.

Blount bill.—Under the provisions of the Blount bill, the Railroad Commission can determine the price at which gas may be sold so as not to constitute waste where (1) the gas contains less than 1,000 B.t.u. per M.c.f.; (2) gas is produced at points remote to a connection for transportation; (3) gas is produced at pressures too low for transmission; and (4) gas contains more than 1,000 B.t.u. per M.c.f., but sale at 10 cents per M.c.f. would constitute waste.

The bill states that there is "no true competitive market price for gas in many fields" and that "both economic and physical waste" result from current price practices. It also declared that the well-head price is related to conservation and that widely varying prices exist between prices being paid producers by the gas purchasers.

Background.—The question of minimum-price legislation was revived recently when the United States Supreme Court on December 11, 1950, held constitutional an order of the Oklahoma Corporation Commission fixing a minimum price of 7 cents per M.c.f. for gas produced in the Oklahoma portion of Hugoton field. Kansas has an 8-cent minimum price for gas produced in its portion of the Hugoton area. In the Texas portion of Hugoton an average price of 5 cents per M.c.f. is currently being paid.

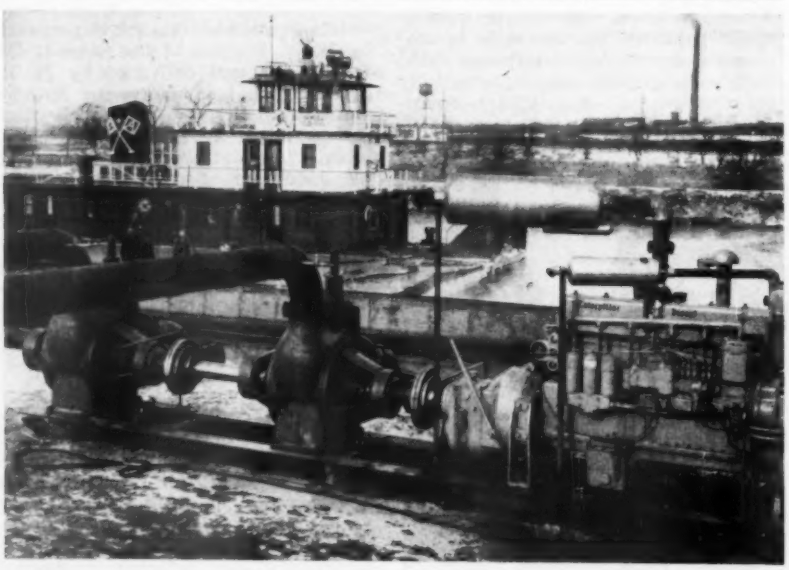
The Oklahoma law authorizes the commission to determine the minimum price for a field after study, but so far the law has been applied only to Hugoton field. The Blount bill calls for a blanket state-wide law with the minimum price to be set by the legislature.

Opposition.—Prime argument of the opponents will be on the grounds of the violation of the principle of free enterprise. Passage of minimum-price legislation would be dangerous in that it would provide a wedge for additional regulation on a state level.

Crude-oil purchasers see in the proposed legislation a danger that it could lead to similar proposals covering the pricing of crude oil at the well head.

Kansas action.—Meanwhile, impounded funds amounting to an estimated $7,500,000 have been ordered distributed to royalty holders and land owners in the Kansas area of Hugoton gas field. The order, issued by the Kansas Corporation Commission, held that money which had accumulated under a minimum well-head price set by the commission 2 years ago, be handed out to 8,800 persons by April 1.

The 8 cents per thousand cubic feet price will net Hugoton producers approximately $3,500,000 a year in additional gas revenues, Commission Chairman Jeff Robertson said.



"Shortest Products Line"

This 3,200-ft. products pipe line, which may have been the country's shortest outside a refinery, was placed in emergency operation recently when workmen closed the Brandon locks on the Mississippi River below Joliet, Ill., for repairs. The line supplied winter fuel to thousands of users in the Chicago area for 6 weeks while the locks were closed to barge traffic. Working 'round-the-clock, it handled an estimated 2,000,000 bbl. at a rate of 240,000 bbl. daily. Ten oil companies formed Emergency Illinois Waterway Pipeline Co. to engineer the project, and thereby avoided an estimated 75 per cent cutback on terminal shipments of products.

C. B. Carpenter Honored

DALLAS.—The United States Department of Interior has awarded its distinguished - service gold medal posthumously to Charles B. Carpenter for outstanding technical accomplishments and leadership in conserving oil and gas during his 22 years of service with the Bureau of Mines. Carpenter was supervising engineer for the Bureau of Mines in Dallas when he died last summer.

The medal, the department's highest honor, was presented to Mrs. Carpenter on February 16 by H. B. Hill, supervising engineer at Dallas before Carpenter and now retired.

Arkansas Gets Unit Law

LITTLE ROCK.—A field unitization law for the State of Arkansas has been signed by the governor.

A number of other bills affecting the oil industry remain to be acted upon by the legislature. The most important is Senate Bill 382, which would raise the present severance tax on oil to 25 cents a barrel.

Scurry Wells Sold

DALLAS.—Bert Fields and associates have sold 11 producing wells on 352 acres in Kelly-Snyder field of Scurry County, Texas, to Joe A. Humphrey and others. Total consideration was over $3,000,000.

The deal involved six leases having a daily allowable of about 1,600 bbl. Five of the wells are on the P. T. Harmon 190-acre lease in 210-97-T&TC; two on the L. L. Lewis 80-acre lease in Section 210, and two on the A. B. Ficke 80-acre lease in Section 205.

Two wells on smaller leases described as W. E. Bentley and Union Methodist Church, were grouped as one well, and Tex-Mex Drilling Co., owned by Fields, turned a half interest in another well.

Louisiana Allowable Set

BATON ROUGE.—Louisiana's daily oil-production allowable in March will be 637,513 bbl., an increase of 1,228 bbl. over the February figure, the State Conservation Department has announced.

The March figures, in barrels and by districts, are: Houma, 119,665; Lafayette, 157,942; Lake Charles, 74,320; New Orleans, 164,911, Monroe, 69,737; and Shreveport, 50,938.

GULF COAST

Chacahoula Gets New Pay

NEW ORLEANS.—The premise that major oil reserves lie in the deeper penetrations on the flanks of the old piercement-type salt domes of coastal Louisiana was further substantiated last week by Sun Oil Co. in the old Chacahoula field southwest of Thibodeaux in Lafourche Parish.

After drilling three dry holes too close to the salt core, the fourth consecutive stepout on the north flank found a new pay below 14,145 ft., about 4,000 ft. below the deepest producing level for the field.

The Sun Oil 2 Levert Morvant, in 58-15s-15e, tanked 251 bbl. of 29.1°-gravity oil in 12 hours through a ⅛-in. choke on initial flow tests. Gas-oil ratio was 1,790 cu. ft. Tubing pressure was 5,700 psi. Casing was perforated from 14,145-60 ft., after drilling to a total depth of 14,505 ft. and setting the long string on bottom.

Chacahoula, once called Thibodeaux, was one of the first salt domes to be discovered by geophysical instruments in southern Louisiana. In 1926 a refraction-seismograph party mapped a shallow salt dome near gas seepages. However, it was not until 12 years later that first commercial oil production was found when Sun's 1 Dibert, Stark & Brown was completed on September 6, 1938. Drilling found cap rock as shallow as 1,035 ft. and salt at 1,302 ft.

More than 10 different reservoirs have been developed to date from Miocene sands ranging from 4,300-4,500 ft.; 6,100-6,700 ft.; 7,700-7,800 ft.; 8,200-8,300 ft.; 8,600-8,800 ft.; and 9,600-ft. sands.

Refinery Processes Studied

LAKE CHARLES, La. — Existing catalytic cracking units can be used to better advantage in processing heavy gas oils for motor-fuel production rather than light stocks, Davis Reed, Universal Oil Products Co., Chicago, told members of the Western Petroleum Refiners Association at its regional meeting here last week.

Reed, discussing recent developments in catalytic cracking, catalytic reforming, polymerization, and alkylation, all of which are important for manufacture of aviation fuels, also outlined the role of the Platforming unit in producing aromatics for aviation fuels. He discussed data for laboratory blending of the three grades of aviation gasoline from platformate, alkylate, and isopentane, and said that the Platforming process can be effectively utilized to relieve present shortages of aromatics, and to produce base stock for aviation gasoline.

CANADA

Canada Gets Platformer

Canadian Oil Companies, Ltd., has announced that a 3,800 bbl. per day Platforming unit will be built at its new Froomfield, Ont., refinery. The new catalytic reforming unit will be constructed by Procon, Inc., an affiliated company of Universal Oil Products Co., developer of the process.

Construction of the 20,000 bbl. refinery will commence shortly, according to W. Harold Rea, president of Canadian Oil Companies. Canadian Kellogg Co. has the contract for a fluid catalytic cracking unit, and facilities for catalytic polymerization and light-ends recovery. The new refinery will process western Canadian crude to be shipped into the Sarnia area by Great Lakes tankers, and will produce a full range of fuel products, including L.P.G.

The new Platforming unit will upgrade straight-run naphthas to high-octane-gasoline components and will also yield aromatic chemicals to be supplied to the nearby synthetic-rubber plant of Polymer Corp. The unit will be the first of its kind in Canada, and the first to be contracted outside the United States.

Gas Line is Planned

OTTAWA.—Application has been made to the Senate for incorporation of Trans-Canada Pipe Lines, Ltd., which is sponsoring a proposed transmission line to deliver natural gas from Alberta to Montreal and Toronto at a cost estimated at $250,000,000. The Senate committee on transportation and communications has approved the measure.

Announcement has been made that the company plans to pipe Alberta gas east in the off-peak periods and store it in six abandoned gas fields in Ontario. It is estimated there is potential storage for 100 billion cubic feet. To reach the storage areas, a lateral line would be run from Toronto to southwestern Ontario.

The only such storage at present in Ontario is that carried out by Union Gas Co. since 1942 in Dawn field. Union has three storage pools in the field, of which two, with aggregate capacity of 15 billion cubic feet, are in use.

MEETINGS

A.P.I. Program Readied

BEAUMONT.—William J. Murray, Jr., member of the Texas Railroad Commission, will address the opening session here March 7 of the spring meeting of the southwestern district, American Petroleum Institute division of production.

Other major addresses will be given at the 3-day meeting by J. C. Donnell II, president, Ohio Oil Co.; and Dr. William R. Spriegel, dean of college of business administration, University of Texas. General arrangements have been directed by Waldo Wilson, Wilson-Broach Co., Beaumont; and the program committee is headed by Olin G. Bell, Humble Oil & Refining Co., Houston.

The semifinal program for the meeting includes the following papers:

"Down-the-Hole Pressure Surges and Their Effect on Loss of Circulation," by W. C. Goins, Jr., J. P. Weichert, J. L. Burba, Jr., and D. D. Dawson, Gulf Oil Corp., Houston; and A. J. Teplitz, Gulf Research & Development Co., Pittsburgh; "Design of an Electrical Analog for Sucker Rod Problems," by F. C. Todd, Battelle Memorial Institute, Columbus; "Wire Line Pressure Setting Assembly," by C. A. Greve, Baker Oil Tools, Inc., Houston; "Technological Progress During Fifty Years," by C. A. Warner, Houston Oil Co. of Texas, Houston; "A Report on Oil Emulsion Drilling Fluids," by H. W. Perkins, Sun Oil Co., Beaumont; "Efficient Bit Nozzle Design," by John R. Eckel and W. J. Bielstein, Humble Oil & Refining Co., Houston.

"Results of Survey on Primary Cementing Practices," by Louis F. Davis, Atlantic Refining Co., Dallas; "Thin Oil Column Completions in the Louisiana-Mississippi Gulf Coast Area," by Ray G. Loper, Louisiana State University, Baton Rouge; "A New Electrical Well Logging System," by R. H. Winn and W. J. Greer, Halliburton Oil Well Cementing Co., Houston; "High-Speed Electronic Reservoir Analyzer," by O. L. Patterson, Sun Physical Laboratories, Newton Square, Pa.; and K. E. Montague and Byron Wiess, Jr., Sun Oil Co., Beaumont; and "The Neutral Zones in Drill Pipe and Casing, and Their Significance in Buckling and Collapse," by A. Klinkenberg, N. V. De Bataafsche Petroleum Maatschappij, The Hague, the Netherlands.

EUROPE

Journal Special

Packaged flight tours to Third World Petroleum Congress in Holland May 28-June 6 to be sponsored by The Journal

COMPLETE "package-tour" arrangements to and from the Third World Petroleum Congress, which will be held at The Hague, the Netherlands, May 28-June 6, will be sponsored by The Oil and Gas Journal in collaboration with Pan American World Airways and American Express Co.

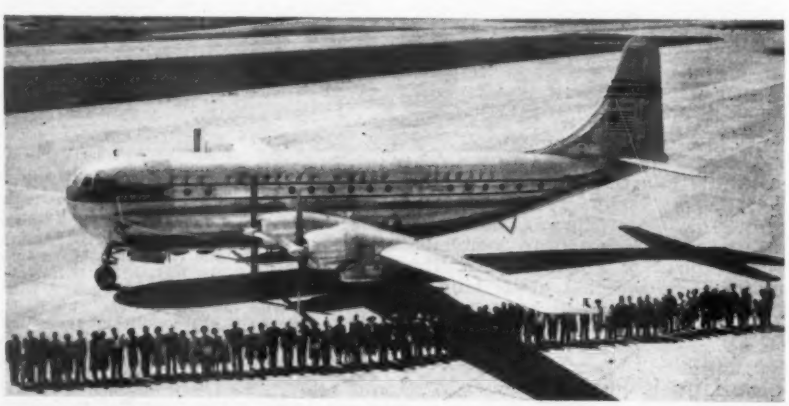
A Pan American Strato Cruiser, designated as "The Oil and Gas Journal Special," will depart from New York City's International Airport May 25. The flight, which may be made up of several sections, is part of a 22-day escorted tour arranged by American Express which will include visits to Belgium, Paris, and London in addition to all sessions of the petroleum congress.

Congress sessions.—The congress sessions will include the presentation of 200 or more technical papers, with the meetings sectionalized as follows: Geology — Geophysics; Drilling and Production; Physical Operations in Oil Processing; Oil Processes Involving Chemical Conversions; Production of Chemicals from Petroleum —Their Properties and Applications; Measurement and Control—Analysis and Testing—Composition of Petroleum; Utilization of Oil Products; Construction of Equipment—Materials, Corrosion; Transport, Storage, and Distribution; Economics and Statistics — Documentation — Education and Training.

Lectures.—There also will be a series of general lectures, with the speakers including Prof. G. C. Hugel, Institut Francais du Petrole; Dr. C. M. Lees, Anglo-Iranian Petroleum Co., Ltd., London; Prof. J. J. Broeze, director, Royal Dutch-Shell Laboratory, Delft; and Dr. E. V. Murphree, president, Standard Oil Development Co., New York.

Information on the complete "package tour," price of tour, detailed arrangements (all hotel rooms and all transportation are part of the ticket plan), and reservations may be obtained from Pan American World Airways System through Norman Eaton, P. O. Box 2601, Dallas; or American Express Co., through District Manager Frank W. Erickson, 1409 Commerce Street, Dallas.

New planes.—Pan American will fly its new 75-passenger "Clipper America" planes, which are the largest and fastest commercial land planes in the world. The new Clipper Americas are now being delivered to Pan American by Boeing Airplane Co. These airplanes are built with a double deck, and passengers can move around freely between the main cabin upstairs and the lounge on the lower deck. The Clippers have a normal operating altitude of from 15,000 to 25,000 ft. They maintain a sea-level cabin altitude up to 15,000 ft. and a cabin altitude of only 5,500 ft. at 25,000 ft. The new ship is an outgrowth of engineering experience with the B-29, B-50, and C-97 bombers and freighters.



ALL ABOARD!—Not quite yet, but that will be the signal at 10:00 a.m., May 25, for 75 passengers to embark on the first section of "The Oil and Gas Journal Special" Strato Clipper of Pan American World Airways, flying direct to The Hague, the Netherlands, and the inauguration of the Third World Petroleum Congress May 28-June 6.

Third World Petroleum Congress

MAY 28 TO JUNE 6, 1951

Itinerary of escorted tour, sponsored by The Oil and Gas Journal, in collaboration with Pan American World Airways and American Express Company

Friday, May 25
Leave New York (International Airport) 10 a.m. by Strato Clipper of Pan American Airways, "The Oil and Gas Journal Special."

Saturday, May 26
Arrive Amsterdam, Holland, 8:45 a.m.
Transfer to hotel.
Remainder of morning at leisure.
In the afternoon a short sightseeing drive around Amsterdam via Mint Square, Rokin, Damrak, Weeping Tower, Royal Palace, Leidse Square, Rijks Museum.

Sunday, May 27
Morning at leisure in Amsterdam.
In the afternoon by special motor coach to The Hague.

Monday, May 28, to Wednesday, June 6
Attending Third World Petroleum Congress.

Thursday, June 7
Transfer to station.
By morning train to Brussels.
Transfer to hotel.
Half-day tour of city — Half-day city sightseeing via Ste. Gudule Church (visit) Unknown Soldier Memorial, Parliament, National Shooting Gallery (rifle-range visit), King's Palace, Palace of Justice, Grand Place, Stock Exchange.

Friday, June 8
Morning at leisure.
Transfer to station.
By afternoon train to Paris.
Transfer to hotel.

Saturday, June 9
In Paris.
Half-day tour of city—Half-day visit of city including opera, Place Vendome, Ste. Chapelle, Pantheon, Notre Dame, Madeleine Church, Arc-de-Triomphe, Eiffel Tower, tomb of Unknown Soldier, and many other points of interest.
Half-day tour to Versailles—Half-day tour to Versailles visiting the Palace, Grand Trianon, Museum of Carriages, Petit Trianon. Return to Paris via St. Cloud.

Sunday, June 10
In Paris, at leisure.

Monday, June 11
Day at leisure for shopping, etc.
Transfer to airport.
By evening plane to London.
Transfer to hotel.

Tuesday, June 12
In London.
Half-day city sightseeing — Half-day of city sightseeing via Trafalgar Square, Buckingham Palace, Victoria Embankment, the Thames, Financial Center, the scene of the great fire raid of December 29, 1940; London Bridge, Tower of London, St. Paul's Cathedral, Fleet Street.
Afternoon at leisure.

Wednesday, June 13
In London.
Full-day tour to Windsor and Hampton Court.—Full half-day to Windsor and Hampton Court. Proceed via Bayswater Road, Nottinghill Gate, Holland Park Avenue, Shepherds Bush and Great West Road to Stoke Poges. Continue to Maidenhead and embark steamer at Boulters Lock for Windsor Bridge. Visit castle thence via Runnymede and Staines to Hampton Court. Return to London.

Thursday, June 14
In London, day at leisure.
Transfer to airport.
Leave London 7 p.m. by Strato Clipper of Pan American Airways, "The Oil and Gas Journal Special."

Friday, June 15
Arrive New York 8:10 a.m.

Belgian Refinery

Antwerp plant now in final phases of postwar expansion program; facilities will process Middle East crude oil

Dahl M. Duff

THE Belgian refining and marketing company, Raffinerie Belge de Petroles, S.A., is now in the final phase of a postwar-expansion program under which capacity of its Antwerp plant is being enlarged several-fold and equipped to process Middle East crude.

Foundations are now in and work is proceeding on the erection of a new 8,000-bbl. daily topping unit. Completion of this unit in September will allow a balanced refining operation by providing sufficient distillation capacity for the recently added reforming, thermal cracking, and vis-breaking facilities.

Built in 1933.—The R.B.P. refinery was built in 1933 and prior to the current expansion had a capacity of 150,000 tons (about 2,500 bbl. daily). Equipment consisted of a series of 12 shell stills with atmospheric and vacuum towers, originally based on patents of the late Dr. Michael Melamid for treating high-sulfur Panuco (Mexican) crude.

Realizing the need for larger and more modern facilities which would be in line with the shift of European refineries to Middle East crude, the company several years ago negotiated for the purchase of four units from the Santa Fe Springs, Calif., refinery of Caminol Co. This plant had been shut down in 1947.

From Caminol, R.B.P. bought a 1,500-bbl. daily reforming unit, a 2,000-bbl. daily thermal cracking unit, a 2,000-bbl. daily vis-breaking unit, and a gas plant, all of which had been added to the Santa Fe Springs refinery during the war. The units were taken down and shipped to Antwerp in 1949.

Units operating.—The reforming, cracking, and vis-breaking units went on stream in Antwerp last October. The gas plant, which consists of equipment for separating and taking off gases for L.P.G. sales, will be connected later.

These former Caminol units are too large for the existing topping equipment. The new topping unit now being erected was designed and engineered by Head-Wrightson Co. in England and was erected by the Belgian firm, Chaurobel Co. The existing unit is now running both Middle East and asphaltic crude from the Western Hemisphere, and after the new topping plant goes on stream, it will revert back to asphaltic crudes only.

Storage.—As a further part of its expansion, R.B.P. is adding considerable storage capacity. Two 23,000-cu. m. (about 145,000 bbl.) tanks are under construction, and another 20,000 cu. m. (126,000 bbl.) is being erected in other sizes. The 23,000-cu. m. tanks will be the largest in Belgium. The tank-car and truck-loading racks located between the old and new sections of the refinery also are being increased.

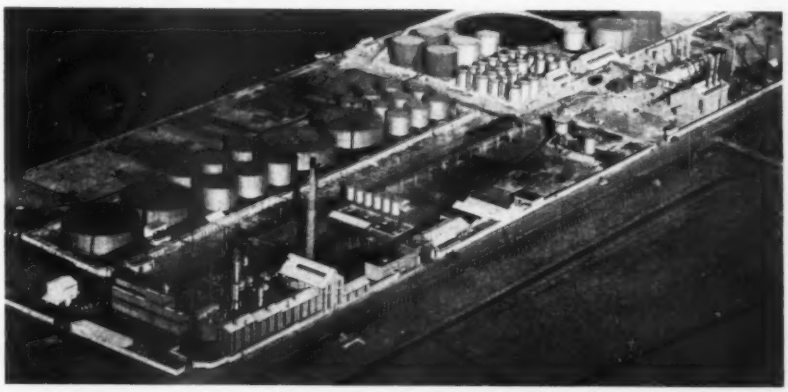
R.B.P. markets its own products through tributary territory in the Benelux countries, the Rhineland, and Switzerland. The company, however, has no branded products, and its motor-fuel output is sold. It has a long-term contract arrangement with Anglo-Iranian Oil Co., Ltd., for Middle East crude, and buys the asphaltic crude on the open market. It makes export sales, and for its inland distribution, operates five barges in Belgium and Holland as well as tank trucks and tank cars.

Other projects.—The R.B.P. expansion is one of three refinery projects now being carried forward in Antwerp. Soc. Industrielle Belge des Petroles (Anglo-Iranian and Petrofina) are building a 30,000-bbl. refinery which is due to be completed the middle of this year. Esso Standard refinery is about to start work on a 25,000-bbl. daily plant which will probably be completed in 1953. Belgian refinery capacity heretofore has been made up of seven small plants with an aggregate capacity of about 8,000 bbl. daily.

R.B.P.'s sister company in Germany, Mineroel Asphalt Werke, expects in March to place on stream its partially rebuilt refinery on the Kiel Canal at Ostermoor in Schleswig-Holstein. Prewar, this plant had a capacity of about 5,000 bbl. daily, using two banks of shell stills, atmospheric distillation, and a tower for special boiling-point fractions.

The equipment shown here was originally erected at the Caminol refinery at Santa Fe Springs, Calif. It is now a part of the R.B.P. refinery in Antwerp. The units are the cracking and viscosity-breaker fractionators and evaporators.

Hit by war.—It was almost completely destroyed during the war. Some tankage and about half the units have been reconstructed sufficiently to permit runs at about 1,200 bbl. daily. The plan is to make test runs, and from them determine what should be done in the way of additional equipment and reconstruction. At present, the Ostermoor refinery will use Lagunillas crude, but it is planned later to use Middle East crude and take a lube cut from the operation. Initially, the plant will be used mainly to meet asphalt and bunker requirements in the local area.



This aerial view shows the R.B.P. refinery at Antwerp. The old part of the plant is at lower left. Foundations for the two new 23,000-cu. m. tanks are at upper right.

Portugese Test Abandoned

Companhia dos Petroleos de Portugal is reported to have abandoned as dry its 1 Montalegra well which was drilled about 25 miles northeast of Lisbon.

The hole was taken to about 5,900 ft. where it was bottomed in basement rock. It was drilled with a German rig on the Aruba structure and is said to be the deepest test ever carried out in Portugal.

Cia. dos Petroleos is planning to continue its exploratory program with further drilling along the coast 50 or 60 miles north of Lisbon. American-made equipment is being rehabilitated for this work.

The company is owned 51 per cent by the Portuguese Government and 49 per cent by the Swedish firm, A. Johnson & Co., which operates a refinery in Sweden and has shipping and other industrial interests in Europe. The Portuguese company holds concession rights in scattered areas comprising about a fourth of Portugal.

A geologist of the Amt fuer Bodenforschung recently left Germany to act as adviser for the program. Cia. dos Petroleos formerly had a contract with Exploration Contractors, Inc., New York, for geological and geophysical work. Drilling carried at relatively shallow depth several years ago developed some oil shows on the Torres Vedras structure about 15 miles north of Lisbon, and it is expected that this area will later be further tested.

New Dock Gets First Crude

The first cargo of crude recently arrived at the new oil dock of Anglo-Iranian Oil Co., Ltd., at Finnart at the head of Loch Long in Scotland.

Finnart, on the west side of Scotland, is connected by a pipe line, now nearing completion, with the Grangemouth refinery of Scottish Oils, Ltd., an Anglo-Iranian subsidiary. Construction of the Finnart depot and the pipe line is a part of the current Grangemouth expansion program under which capacity of the plant is being increased from 600,000 to 1,800,000 tons a year (about 36,000 bbl. daily).

Work on the Finnart depot began in May 1950 and was completed 2 months ahead of schedule. Loch Long provides deep water sufficient for the large supertankers to be used on the Persian Gulf-United Kingdom haul. Vessels of this size cannot be brought through the locks at Grangemouth which is on the Firth of Forth.

The first cargo of crude received at Finnart consisted of 22,400 tons from Kuwait, brought in the 24,000-ton Norwegian tanker, Tank Empress, under charter to Anglo-Iranian. The pipe line across Scotland to Grangemouth is a 12-in., 60-mile line.

Labor Discussions

Oil industry hopes for settlement in Venezuela

INDUSTRY sources last week hoped for an early solution to the current negotiations for new labor contracts in Venezuela.

The new agreements will succeed those signed early in 1948 which provided reopening at the end of 2 years. First to expire February 9 was that of the largest Venezuelan producer, Creole Petroleum Corp. Others run out at various dates up to mid-March.

The situation has been made more difficult by the fact that the government dissolved most of the Venezuelan oil unions following the wildcat strike which shut down the industry for nearly a week last May. The government has been encouraging a new labor organization which is reported to be gaining considerable strength.

Demands unacceptable.—A list of completely unacceptable demands have been presented to the companies by the new union groups. Meeting these, it has been estimated, would require more than the total earnings of some of the companies. Many of the demands relate to so-called fringe benefits other than wages, such as schooling for fourth-degree relatives and completely free medical attention for dependents.

There are indications that if no agreement is reached, the government may step in and decree a settlement in the interests of stability of the country's principal industry and revenue producer. Already, the government has by decree extended the old expiring contracts during the interim pending new agreements, with the provision that the companies cannot discharge men without government approval.

Latest development reported from Caracas was that the separate unions in each camp had agreed with the Ministry of Labor that a single unified contract should be worked out instead of holding separate negotiations with the various groups in each field area. Negotiations on this basis are to begin in Caracas this week.

Study.—A study published by the Petroleum Department of Chase National Bank in 1949 tabulated Venezuelan labor costs and said they were among the highest in the world, including indirect benefits. The basic wage and indirect benefits under the old contracts added up to a total cost per man of nearly $16 per working day.

The 1948 contracts raised costs in payrolls by about 20 per cent. Although the current negotiations are by no means settled, persons familiar with the situation feel that a further increase in the order of 10 to 12 per cent over-all may be the result.

Concern noted.—During the last 2 years, there has been concern among Venezuelan officials and in the industry that high labor costs and taxes in the country were having the effect of pricing Venezuelan oil out of some of its markets. This has been especially the feeling regarding Europe where Venezuelan production meets oil from the Middle East.

It was partly for this reason that the new arrangement providing a partial split of earnings between Arabian American Oil Co. and the Saudi Arabian Government created considerable interest in Venezuela. However, it is said that Venezuelan costs of production are still far above those in the Middle East, even considering the new tax and royalty plans, and that a 10 per cent increase in payroll costs in the Latin American country would further widen this differential.

Brazilian Discovery

Test in Bahia area makes 1,000 bbl. daily

AN oil discovery has been made by the Conselho Nacional do Petroleo of Brazil in an exploratory well at Almas 4½ km. east of Candeias field in the Bahia area.

The Almas well was reported to have shown about 1,000 bbl. daily on a production test at 1,150 m. (3,770 ft.). Formation pressure was 1,500 psi. The production came from a 17-m. (56 ft.) thickness of Sergi sand.

Another successful wildcat of the Brazilian Government oil organization was drilled at Agua Grande. This well showed for about 300 bbl. daily at a depth of 1,300 m. (4,250 ft.). The well was reported to be to the north of the present Bahia fields but not located definitely.

The conselho has developed five fields in the Bahia region and has been drilling in an effort to discover major production elsewhere in the country. Of the five small fields, the most important is Candeias which produces 26°-30°-gravity crude from the Cretaceous at from 2,500 to 4,000 ft. This field is the main source of crude for the newly opened 2,500-bbl. daily refinery which was built by M. W. Kellogg Co. at Mataripe near Salvador.

Deep test.—The conselho's deep wildcat, the Limoeiro well in the Amazon River delta area about 120 km. southwest of Belem on the west side of the Rio Tocantins is reported to be drilling ahead below 2,600 m. (8,550 ft.) with no signs of oil yet en-

"I wasn't asleep," said the Dormouse

EVERY boy and girl knows the drowsy Dormouse of Alice in Wonderland. He was elbowed and pinched by the Mad Hatter and the March Hare as he mumbled in his sleep at the tea party.

But our young people aren't so well versed in everyday economics. They have a sadly distorted picture of the profits of business. They don't realize why profits are necessary, how small they are, or how they are divided.

For instance, in a recent survey of high school seniors, it was discovered that they believe over 50% of the sales dollar is profit and they think stockholders receive 24% of it. Actually business profit averages less than 8%, with less than 3% distributed as dividends. Business uses most of its profit, moderate as it is, for new plant and equipment, to improve products and to make more jobs.

Misconceptions among our youth bode ill for America's future. They open the door for too ready acceptance of dangerous isms and false foreign philosophies. Such misunderstanding of economics can be corrected only with facts supplied by business itself. You as a leader in your community must share this responsibility.

The American business man must not allow himself to be cast in the role of the Dormouse, pinched and pilloried by the March Hares of communism and the Mad Hatters of the "everything for nothing" state.

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countered. The well is being drilled by Drilling & Exploration Co. Cost of this exploratory venture is approximately $1,000,000. There is believed to be about 15,000 ft. of sediment in this area, and the Limoeiro test is expected to be taken as deeply as possible.

The conselho's program calls for an exploratory well in the Maranhao-Piauhi basin northwest of Bahia. This well is expected to be spudded in shortly near Carolina. Other exploration wells scheduled to get under way soon will be near Jaboatao in the State of Sarjipe and also in the Parana basin in southern Brazil.

Fields.—As of the end of the year, the Bahia fields and wells drilled in each were: Candeias, 64 oil, 1 gas, 10 dry; Dom Joao, 30 oil, 2 dry; Itaparica, 76 oil, 5 gas, 6 dry; Aratu, 3 oil, 7 gas, 3 dry; and Lobato-Joanes, 4 oil, 13 dry.

In addition, one oil well and three dry holes had been drilled at Pitanga. Production is limited to the needs of the refinery outlet. In December, total output was 21,296 bbl. of which 17,426 bbl. came from Candeias, 3,043 bbl. from Itaparica, and 827 from Dom Joao.

MIDDLE EAST

Refinery Agreement Reached

A new agreement pertaining to operation of the Haifa refinery in Israel was reached recently in London between an Israeli Government delegation and oil-company representatives after several weeks' negotiations.

In Haifa it was reported that the refining operation would be stepped up and a second unit placed in operation as a result of the new arrangement. Overhaul of the second unit is to begin in the near future.

Haifa sources said last year's production rate of the refinery was 700,000 tons (about 14,000 bbl. daily) and that it is hoped to double this. A brief announcement in London said only that the agreement covered problems outstanding in connection with the refinery and that a sufficient supply of refined products from the plant was assured for the Israeli market.

The Haifa refinery, once a major export plant and one of the most important in the Mediterranean area, was shut down in the spring of 1948 when the Iraq Government refused to permit the normal crude supply to continue from Kirkuk field through the Kirkuk-Haifa pipe line. The Iraqis have refused to modify their position which was the result of the Arab-Israeli strife.

The Haifa refinery has a total capacity of approximately 83,000 bbl. daily. Anglo-Iranian Oil Co., Ltd., operates the plant and is half owner with Shell. Socony-Vacuum Oil Co., Inc., shares in the throughput.

Qum Exploration Planned

Iranian Oil Co., a national company, is reported in Teheran preparing to begin drilling in the near future in the region of Qum, about 65 miles southwest of Teheran.

Drilling equipment has been bought in the United States, and part of it already received in Persia. Some American assistance is being provided in connection with the drilling operations.

Iranian Oil Co. is responsible for the development of all oil areas outside the territory of the concession of Anglo-Iranian Oil Co., Ltd., in Southwest Persia. It has been carrying on survey work for some time, and broke into the news last July when the Russian Government made a formal protest against its aerial photography along the Soviet-Iranian border.

The drilling now reported ready to be carried out will be based on work by Prof. Arnold Heim, a Swiss geologist, who with seven colleagues has been assisting the Iranians in their oil exploration. The Iranian Government has indicated it will not grant any further concessions either to Russia or to the Western nations.

The areas of exploration by the Iranian national company has been divided into eight zones. The Qum area in Zone 2, where the first drilling is to be undertaken, is 120,000 sq. km. and includes the central plateau of Persia and the barrier Dasht-i-Kavir desert. The cost of operations in this area is estimated at the equivalent of approximately $1,600,000.

In Teheran, it was said the company also plans to drill in Zone 1 which comprises the Caspian Sea provinces. By the end of next year, it is expected that the preliminary surveys of Zone 3, which includes the Kerman Coast near the Gulf of Oman, will have been completed, and that it will be possible to test this region.

Restrictions May Be Relaxed

A special government committee in Cairo, which has been examining the protests made by several countries against Egypt's action in halting Suez Canal tanker cargoes which it believes were bound for Israel, last week recommended that the restrictions be relaxed.

The committee pointed out that gasoline and other "war materials" reached Israel through channels other than the Suez Canal. It has been reported that the reduced level of operation of the Haifa refinery has been carried out by bringing crude around Africa and from the Caribbean, thus avoiding the Suez passage.

AFRICA

African Refinery

Standard-Vacuum to build facilities in Durban area

PLANS for the construction of a new refinery of about 10,000 bbl. daily capacity in the Union of South Africa were announced over the weekend by Standard-Vacuum Oil Co.

The new plant will be the first petroleum refinery in the country. It will operate on imported crude and will be located on a 200-acre site near Durban where deep-sea terminal facilities already exist. Construction costs are estimated at about $12,000,000, and completion is scheduled in late 1953 or early 1954, according to L. W. Elliott, Standard-Vacuum president.

The new refinery will produce a range of products running from gasoline to fuel oils for the South African market which has been served by the Standard-Vacuum organization for more than 50 years. It is anticipated that ground-breaking operations will start early in 1952.

Disclosed earlier.—An earlier disclosure of plans for the refinery was made in Capetown by the South African Minister of Economic Affairs. This announcement referred to a new company, Standard-Vacuum Refining Co. of South Africa, Ltd., which will build and operate the plant. The company's present marketing operations in the country are carried out mainly through Vacuum Oil Co. of South Africa, Ltd.

A Standard-Vacuum project to build a refinery in South Africa was first reported in the industry several years ago. Presumably it will use crude from the Middle East.

Kenya Work Encouraging

While warning against premature hopes, the government of Kenya in East Africa has said that encouraging results have been obtained in oil exploration work now under way.

The preliminary survey is being carried out with the assistance of United States geologists employed through the Economic Cooperation Administration. As a result of the results thus far, geophysical work is to be undertaken.

The government statement in Nairobi, the capital of the British crown colony and protectorate, however, said that rumors that oil discoveries had been made or ideal structural conditions found are incorrect. Seepages have been found on several occasions in recent years in Kenya but they all proved unworthy of development.

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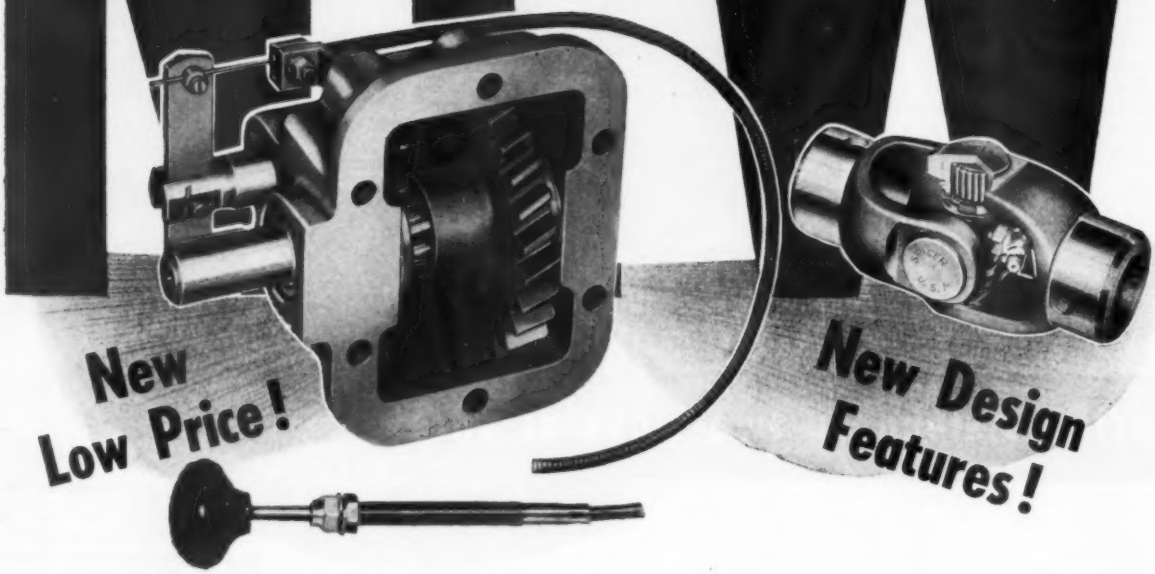

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In New Job

Kingman elected new vice president of Union Oil Co.

KENNETH E. KINGMAN, who joined Union Oil Co. of California as a junior chemist at its Los Angeles refinery in 1929, has been elected vice president in charge of manufacturing. He has been manager of the department since October 1949.

A native of Riverside, Calif., Kingman graduated with a chemical engineering degree from California Institute of Technology in 1929, where he lettered in both football and track.

He joined Union Oil the same year, and in 1932 he was named an engineer in the development department. In 1935 he was appointed assistant superintendent of operations at the Los Angeles plant, and in 1937 he was transferred to the firm's Oleum refinery where he filled a number of positions, including superintendent of operations from 1941 to 1944. In 1949 he became manager of the Los Angeles refinery. In his new position he succeeds Basil Hopper, who retired in October 1949.

Allan J. Lowrey, of San Francisco, assistant to the president since joining Union Oil Co. of California in 1939, has been elected a vice president of the firm. Until his affiliation with Union, he was active in banking circles in Hawaii, San Francisco, and New York.

Gus Athanas, formerly at Stanolind Oil & Gas Co.'s North Texas-New Mexico division office in Fort Worth, has been named field engineer at Levelland, Tex., succeeding **Jimmie D. Christner,** who has been transferred to the Abilene, Tex., office.

Winthrop Aldrich, president of Chase National Bank of New York City; **Edward L. Love,** a senior vice president; **Roland C. Irvine,** vice president; and **Dr. Joseph E. Pogue,** petroleum consultant, have been touring the oil areas of the southwest. Among those entertaining the bank officials were: **E. F. Bullard,** president, Stanolind Oil & Gas Co., and **Joseph Bowes,** president, Oklahoma Natural Gas Co., Tulsa; **Amon Carter,** independent oil operator, Fort Worth; officers of the Petroleum Club of Dallas, and **Dee Simpson,** president, National Bank of Commerce, **Jap Neath,** Humble Oil & Refining Co., **George** and **Herman Brown,** of Brown & Root, Inc., and **Paul Kayser,** Western Natural Gas Corp., main host, all of Houston.

Robert H. Parks, reservoir engineer for Sunray Oil Corp. at Tulsa, has been transferred to Midland, Tex., as petroleum engineer.

C. K. Sheperd, supervisor for Continental Oil Co. at Lafayette, La., has been transferred to Denver as regional geophysicist.

W. K. Rickel, seismic party chief for Amerada Petroleum Corp., has been transferred from Dickinson, N. D., to Akron, Ohio.

George H. Fentress, geological engineer for Lion Oil Co., has been transferred from Jackson, Miss., to El Dorado, Ark.

Jimmie D. Harrington, research technologist at Magnolia Petroleum Co.'s field research laboratories, Dallas, has been transferred to the Kermit, Tex., producing district and named petroleum engineer. **Gerald S. Young, Jr.,** formerly petroleum engineer at the Oklahoma City division offices, has been transferred to the West Texas division offices with headquarters at Midland. **Thomas B. Lowary,** petroleum engineer at Duncan, Okla., producing district office, has been transferred to the Oklahoma division offices at Oklahoma City.

Charles R. Overly, petroleum engineer for Humble Oil & Refining Co., has been transferred from Wink to Midland, Tex.

Leonard J. Isern, producer, and **Robert J. Gill,** geologist, have opened offices in Wichita, Kans.

John Brewer, who recently returned from an assignment with Lario Oil & Gas Co.'s Canadian subsidiary, Amcan Oil Corp., will head the reorganized geological department for Lario. New members of the department include: **Charles King,** a recent graduate of Kansas University, and **Frank Morgan,** who recently resigned from the geological department of Stanolind Oil & Gas Co.

Rex Moorman, formerly chief geophysicist of Socony-Vacuum Oil Co. of Venezuela, has been transferred to the New York office of the parent company as chief geophysicist, succeeding **W. W. Hardy,** recently named assistant chief of exploration.

WEBB

TARKINGTON

E. B. Webb, Houston manager of Continental Oil Co.'s production department, and **A. W. Tarkington,** Houston, assistant to the president, have been elected vice presidents of the firm. In his new position Tarkington is to become regional general manager of the company's central region, with headquarters in Oklahoma City. Webb has risen through the ranks in the production department, having joined Continental as a petroleum engineer at Seal Beach, Calif., more than 24 years ago. He was appointed manager of the production department in January 1949 at Ponca City, Okla., and was transferred to Houston in 1950. Tarkington joined Continental as one of the youngest officials of a major oil company in the United States, and was elected treasurer in 1948, and assistant to the president in 1950.

Ernest B. Wilson, formerly vice president of Sterling Oil & Refining Co., has been named president, director and manager of Mikton Oil Co., Houston, succeeding the late J. Perry Scranton.

H. J. Walls, Needville, Tex., and **G. H. Walkup,** Midway, Tex., both pumpers for British American Oil Co., have been named field foremen.

Tom W. Wright, Kansas district geologist for Stanolind Oil & Gas Co. for the past 5 years, has resigned and will operate as a consulting petroleum geologist. A graduate of the University of Nebraska, Wright joined the firm as a roustabout in 1934.

Jack A. Crichton, formerly associated with DeGolyer & MacNaughton as petroleum geological engineer, has joined San Jan Oil Co., Dallas, as

XUM

PERSONALS

PLAN A.P.I. MEETING.—This group is making plans for the American Petroleum Institute's Southwestern district meeting to be held in Beaumont, Tex., next week. Back row, left to right: George Sullivan, Baker Oil Tools, Inc., Houston; W. H. Strang and C. A. Young, A.P.I., Dallas; W. H. Miner, Lufkin Foundry & Machine Co., Houston; Paul Hilton, Baker Oil Tools, Inc., Houston; Olin G. Bell, Humble Oil & Refining Co., Houston; and W. F. Oxford, Jr., Sun Oil Co., Beaumont. Front row, left to right, Waldo Wilson, Wilson-Broach Oil Co., and Harold Denton, Sun Oil Co., Beaumont.

vice president of operations. Crichton is a graduate of Texas A. & M. College and Massachusetts Institute of Technology. He formerly was associated with Union Producing Co.

Donald E. Radtke, formerly petroleum engineer for Magnolia Petroleum Co. in the Healdton, Okla., producing district, has been transferred to the Shreveport, La., district, to be in charge of petroleum engineering in the Laurel, Miss., area. **Martin L. Talley,** petroleum engineer from the Luling, Tex., district, will succeed Radtke at Healdton. **J. W. W. Whitney, Jr.,** petroleum engineer at Electra, Tex., has been transferred to the Shreveport area, in El Dorado, Ark.

Joe Cannon, San Angelo, Tex., has set up a new geological office. The firm of Cannon & Cannon, petroleum geologists, is to continue operations. The move is an expansion, but the two offices will work independently. **Robert Leidecker** will be the new office manager.

Harry H. Heimple, Wichita, Kans., banker has been named president of Derby Oil Co., succeeding **Henry E. Zoller,** who has resigned. Zoller will retain his substantial stock interests in the firm, and will be a candidate for director at the stockholders' meeting April 11.

Klaas Vander Weg, division geophysicist for General Petroleum Corp. at Casper, Wyo., has been transferred to the company headquarters in Los Angeles as chief geophysicist in the exploration department.

Rawleigh Warner, Jr., secretary of Continental Oil Co. at New York, has been named assistant to the president, with headquarters in Houston. **Pete Dominic,** assistant director of sales administration, Ponca City, has been elected secretary of the company, succeeding Warner, with headquarters in New York City. Warner joined Continental at Ponca City, Okla., in July 1948, as assistant treasurer, and was elected secretary of the firm in October 1949.

K. A. Ackley, eastern division manager for Carter Oil Co. at Mattoon, Ill., has been transferred to Tulsa as assistant to the production department manager. **O. D. Harper** of Mattoon, has been named superintendent of the Eastern division and will continue in charge of the division's production department. **Ray Hart,** Tulsa, succeeds Ackley as division exploration manager, and **Wade Turnbull,** Grand Rapids, Mich., has been named Eastern division geologist.

H. R. Langford, Jr., assistant plant superintendent for Stanolind Oil & Gas Co. at the Slaughter gasoline plant, Sundown, Tex., has been transferred to the McCowden, Tex., gasoline plant, in the same capacity.

Jed B. Maebius has been named manager of land and geological activities for Gulf Oil Corp., at Casper, Wyo., district headquarters. **Clyde Hudgins** will be manager for activities in Montana. **Edward Baltrusaitis,** formerly at Saginaw, Mich., has been transferred to Salt Lake City as manager of the Utah district, and **Everett Chapman,** representative in the Rocky Mountains for many years, will be special representative for the firm's exploratory department, continuing headquarters at Denver.

Courtney C. Brown, formerly head of the petroleum - economics division of the coordination and economics department of Standard Oil Co. (N. J.) in New York, has been appointed to the newly created position of assistant to the chairman of the board of directors of the firm. He holds a Ph.D. degree in economics from Columbia University, and taught at Columbia before 1941 when he joined Chase National Bank as associate director of research. He joined Jersey Standard in 1946 after wartime service in Washington.

W. C. Smith, general superintendent of drilling and production for Delhi Oil Corp. at Athens, Tex., has been transferred to Dallas as vice president in charge of drilling and production.

G. Brown Davidson, party chief for Magnolia Petroleum Co., has been transferred from Quanah to Dalhart, Tex., in the same capacity.

Ralph Hamblin, former district geologist for Cities Service Oil Co., is to head an office at Mattoon, Ill., for Transcontinental Oil Corp., of Dallas.

PERSONALS

T. J. Gates, formerly a maintenance-control engineer at the Torrance, Calif., refinery of General Petroleum Corp., has been named refinery engineer. He joined the firm in 1946 as an equipment inspector.

Leslie R. Neal, Jr., engineer for La Gloria Corp., has been transferred from Falfurrias to Waskom field, Texas.

Louis H. Dixon, senior geologist for Esso Colombiana at San Gabriel, Calif., has been transferred to Bogota, Colombia, where he will be engaged in petroleum-exploration work.

C. J. Hughes, formerly superintendent for Columbian Carbon Co. at Logan, W. Va., is now owner of Hughes Drilling & Pipeline Construction Co. at Huntington, W. Va.

W. F. BARBAT

W. F. Barbat, assistant chief geologist of Standard Oil Co. of California, has been named chief geologist succeeding **Dr. W. S. W. Kew,** who is retiring, but will remain with Standard until mid-June to complete special assignments with which he has been engaged. Barbat joined Standard as a geologist at Taft, Calif., in 1927 after graduating from University of California. He was appointed assistant chief geologist in the exploration department in October 1946.

Oscar C. Holmes, district foreman for Sinclair Oil & Gas Co. at Columbus, Tex., has been transferred to Corpus Christi. Other changes in the production department include: **Harold A. Randolph,** district foreman at Pharr, Tex., transferred to Columbus; **Cameron L. Cox,** intermediate petroleum engineer at Pharr, transferred to Columbus; **Joe Mefford,** intermediate petroleum engineer at Columbus, transferred to Pharr; **Ralph W. Newport,** intermediate clerk at Ardmore, Okla., named senior clerk; **Clyde C. Osborn,** junior petroleum engineer at Cushing, Okla., named intermediate petroleum engineer; **Leslie D. Sellers,** district foreman at Lindsay, Okla., transferred to Drumright, Okla.; **Oliver G. Simpson,** senior petroleum engineer at Ardmore, named district foreman at Lindsay; **Winfield S. Hull,** junior petroleum engineer at Kiefer, Okla., named intermediate petroleum engineer; **Troy C. Kadel,** assistant district foreman at Pampa, Tex., named district foreman at Crane, Tex.; **Craig R. Smith,** junior petroleum engineer at Odessa, Tex., named intermediate petroleum engineer; **Claude D. Gaines, Jr.,** intermediate petroleum engineer at Ardmore, named senior petroleum engineer; **Ollie W. White,** senior clerk at Drumright, transferred to Delaware, Okla.; and **Francis M. Singleton,** junior petroleum engineer at Kiefer, named intermediate petroleum engineer.

J. C. Donnell II, of Findlay, Ohio, who has served as president of Mountain Fuel Supply Co. since 1942, has been named new chairman of the

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J. C. DONNELL II *W. NIGHTINGALE*

board. **W. T. Nightingale,** of Rock Springs, Wyo., the firm's vice president in charge of production, exploration, and transmission since 1945, has been elected president of the company. **J. D. Roberts,** of Salt Lake City, remains as vice president in charge of all distribution divisions of the company, and **L. C. Olpin,** of Salt Lake City, is the new treasurer. **L. C. Peschel,** Salt Lake City, was elected to the newly created position of company controller. In addition to serving as chairman of Mountain Fuel's board of directors, Donnell will continue as president and director of Ohio Oil Co., with offices in Findlay.

John E. Pierce, associate engineer for Tide Water Associated Oil Co., has been transferred from Kilgore to Cayuga, Tex. Others changes include: **Roy C. Gould,** associate engineer, from Kilgore to Midland, Tex.; **Sam H. La Croix,** field engineer, from Venice, to Midland, Tex.; and **James L. Smotherman,** lead roustabout, Magnolia, Tex., to Chickasha, Okla.

O. F. Van Beveran has been named assistant general manager of Standard Oil Co. of California's exploration department. Other changes include: **E. C. Doell,** named district exploration superintendent of the southern district, with headquarters at Los Angeles; **W. P. Winham,** appointed district exploration superintendent of the Great Basin district, with headquarters at Salt Lake City; and **E. H. Burtner,** named district exploration superintendent of the northern district, at Bakersfield, Calif.

A. M. Moore, production foreman for Shell Oil Co. at Big Spring, Tex., has been transferred to McCamey as manager of production and drilling.

Daniel L. Hussey, formerly process superintendent of Esso Standard Oil Co., Bayway refinery, Linden, N. J., and Lago Oil & Transport Co. refinery at Aruba, has been named assistant general superintendent succeeding **Bryant F. Kenney** who has joined Standard Vacuum Oil Co. in South Africa.

D. L. HUSSEY

Comer Plummer, senior vice president in charge of production for Pure Oil Co., has been elected a director of the firm. He has been with the producing division for 28 years.

D. A. C. Dewdney, since 1949 research manager of Esso Development Co., has been appointed coordinator of refinery operations by Anglo-American Oil Co., Ltd. His appointment was made in connection with the greatly enlarged scope of refining activities of the Standard Oil Co. (N. J.) affiliate in the United Kingdom. Dewdney has been associated with the Esso organization since 1936. He is a graduate of Birmingham University. **T. R. Bird** has succeeded Dewdney as research manager with Esso Development, English branch of Standard Oil Development Co.

DEATHS

Aaron Bishop Fuller, Sr., 51, Shreveport oil operator, died there last week.

Joseph P. Sweeney, 83, pioneer of Pennsylvania's early oil days, died February 9 in Los Angeles. At the time of his retirement 33 years ago, he was vice president of American Republics Corp. of Houston.

Hugh F. Boggs, 60, general superintendent of production for Richfield Oil Corp., Long Beach, died of a heart attack on February 12. He had been a Richfield employe since 1926 when he joined the firm as production superintendent at Huntington Beach.

Roderick M. Montgomery, 51, independent oil operator, died February 18 at Houston.

Dan Bunnell, Jr., old-time lease broker, died in Tulsa February 20.

XUM

PROGRESS REPORT:

ILLINOIS WATER FLOODS

This article summarizes the important work accomplished by the Secondary Recovery Study Committee for Illinois, of the Interstate Oil Compact Commission, and as recently published in the report, of the Interstate Oil Compact Commission and in Circular No. 165 of the Illinois State Geological Survey.

Membership of committee preparing report: chairman, Frederick Squires (Illinois State Geological Survey, Urbana); A. H. Bell (Illinois State Geological Survey, Urbana); H. R. Bolton (Ohio Oil Co., Terre Haute); C. V. Cameron (Shell Oil Co., Centralia); W. S. Corwin (Tide Water Associated Oil Co., Keensburg); R. E. Dunn (Magnolia Petroleum Co., Salem); R. W. Love (The Texas Co., Salem); R. J. Cassin, secretary (Illinois State Geological Survey, Urbana); Paul Phillippi (Forest Oil Corp., Casey); Mark Plummer (Pure Oil Co., Olney); L. C. Powell (Ohio Oil Co., Terre Haute); Harry Swaneck (Gulf Refining Co., Centralia); Ray Vincent (Sohio Petroleum Co., Centralia); E. C. Wells (Carter Oil Co., Mattoon); M. R. Wilson (The Texas Co., Salem).

ILLINOIS had 31 active controlled floods on January 1, 1950 (see Table 1). These, together with the many McClosky dump floods, had produced about 15,400,000 bbl. of flood oil to January 1, 1950.

This oil was obtained from sands with an average thickness of about 20 ft. which took water at the rate of 10 bbl. per day per foot. Porosities averaged about 20 per cent and permeabilities approximately 150 md. The fluid saturations at the start of flooding averaged 64 per cent oil and 20 per cent water and the ratio of water input to flood oil produced was about 5 to 1 at the end of 1949.

The over-all recovery to January 1, 1950, from the 8,450 acres in the controlled floods was 1,213 bbl. per acre. As only a small part of the state's total oil-producing area of 376,000 acres has been affected by controlled water floods, there remains an extensive territory which has good prospects for oil recovery by water flooding.

Siggins Pool Water Floods

Water - flood history. — Systematic water flooding was first begun in Siggins field in 1942 when Forest Oil Corp. redrilled and flooded 40 acres of the first Siggins sand near the center of the field (Flood 2, Fig. 3).

Since 1942 the flooding has been expanded to 2,000 acres in both first and second Siggins sands. These floods are operated by Forest Oil Corp. and Pure Oil Co. Field daily average production increased from 100 bbl. or less per day in 1940 to 3,000 bbl. per day in October 1949, with a cumulative water-flood production to January 1, 1950, of 3,187,000 bbl.

Water - flood development.—With few exceptions the old wells were plugged and a new five-spot pattern drilled with input wells 440 ft. apart and input to oil well distances about 300 ft. Insofar as possible input wells are completed to have only net pay open to injection and are selectively

TABLE 1 — DATA FOR CONTROLLED

Line No.	Field	County	Project	Water-flood pay	Average depth to water-flood pay	Operator	Date of first water input	As of January 1, 1950: Total acres water-flood pay in field	Total acres flooded	No. of wells: Producers	No. of wells: Input	Plant pressure
1	Aden Consolidated	Wayne	Aden	Aux Vases	3,200	Texas	August 1948	300	400	10	3	1,210
2	Aden Consolidated	Wayne	Aden	McClosky	3,350	Texas	August 1948	300	2,000	12	2	
3	Albion Consolidated	Edwards	Albion	Bridgeport	1,900	Superior	August 1948	192	250	30	3	....
4	Albion Consolidated	White	Biehl	Upper Biehl	1,900	Yingling	August 1949	172	....	10	2	900
5	Bellair	Crawford	Forest-Bellair	Bellair "500"	550	Forest	July 1948	200	...	24	56	285
6	Bellair	Crawford	Fulton	Bellair "500"	500	Pure	July 1948	442	....	124	131	250
7	Benton	Franklin	Benton	Tar Springs	2,100	Shell	November 1949	1,900	2,400	120	84	220
8	Blairsville	Hamilton	Blairsville	Aux Vases	3,275	Texas	June 1948	...	640	16	2	900
9	East Browns	Wabash	North Bellmont	Cypress	2,600	Magnolia	November 1947	174	174	12	3	1,543
10	North Friendsville	Wabash	North Friendsville	Biehl	1,500	Magnolia	July 1947	40	120	3	3	1,386
11	Iola Consolidated	Clay	East Iola	Aux Vases	2,250	Texas	March 1948	40		3	1	667
12	North Johnson	Clark	Pickens Flood	Casey	450	Pickens	May 1949	60	825	17	18	200
13	South Johnson	Clark	South Johnson	Upper Partlow	490	Forest	March 1949	160	1,710	13	24	250
14	Lawrence	Lawrence	Robins	Bridgeport	900	Ohio	August 1948	114	5,050	29	9	300
15	Lawrence	Lawrence	Griggs	Kirkwood	1,350	Ohio	July 1947	35	16,200	9	4	
16	Main	Crawford	Henry-Ikemire	Robinson	925	Tide Water	February 1948	45	34,320	10	12	130
17	Main	Crawford	Wilkin	Robinson	950	Ohio	May 1948	113	†34,320	36	25	....
18	Main	Crawford	Hughes	Robinson	890	Ohio	September 1948	89		28	24	....
19	South Maunie	White	Tar Springs Unit	Tar Springs	2,200	Magnolia	August 1947	230	....	13	11	777
20	New Harmony-Keensburg	White	Greathouse	Bethel	2,750	Sun	January 1949	20	....	4	4	1,200
21	New Harmony-Keensburg	White	Ford "A"	McClosky	2,900	Sun	May 1948	40	....	1	1	15
22	New Harmony-Keensburg	White	Greathouse	McClosky	2,900	Sun	August 1947	60	....	2	2	1,100
23	New Harmony-Keensburg	White, Illinois Posey, Indiana	Waltersburg	Waltersburg	2,220	Superior	August 1946	490	....	45	3	0
24	Odin	Marion	Odin	Cypress	1,750	Ashland	October 1949	196	210	20	1	20
25	Olney Consolidated	Richland	Olney	McClosky	3,000	Texas	November 1946	60	940	1	1	225
26	Patoka	Marion	Benoist Flood	Benoist	1,410	Sohio	September 1943	527	565	81	62	250
27	Patoka	Marion	Rosiclare	Rosiclare	1,550	Sohio	1948	469	489	12	14	
28	Phillipstown Consolidated	White	North Calvin	Biehl	1,900	Magnolia	September 1947	10	....	4	1	1,250
29	Siggins	Clark, Cumbl'd.	Forest	First Siggins	400	Forest	1942	1,200		247	314	200-290
30	Siggins	Clark, Cumbl'd.	Pure	First Siggins	404	Pure	December 1946	482	2,198	121	127	177
31	Siggins	Clark, Cumbl'd.	Pure	Second Siggins	484	Pure	December 1946	289	350			
								8,450	69,813	1,056	946	

*Actual core analyses. †Based on well cored in oil. ‡Corrected for invasion. ‖Estimated figures. ¶Represents same acreage as Line 16.

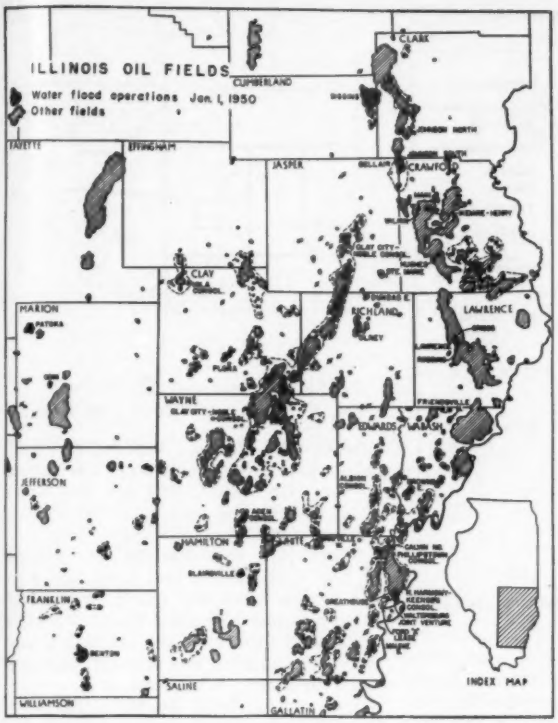

Fig. 1

shot to minimize the natural permeability differences.

Forest Oil Corp. input wells are completed by running a rag packer on 1½-in. tubing with a few sacks of cement to hold it. Only surface casing is used. The input wells of Pure Oil Co. are completed by inserting perforated tubing opposite the pay and gravel packing the annular space. The tubing is then cemented in place and the casing removed.

Well-head equipment on the input wells of both companies consists of a meter between two valves with an additional valve located off the injection line, making it possible to check pressures. Oil wells are conventionally completed pumping wells.

Water source and treatment.—By the first of January 1950, 18,344,000 bbl. of water had been injected into the first and second Siggins sands. This water was obtained from fresh-water wells and produced salt water.

The fresh water comes from a 100-ft.-deep glacial gravel in Hurricane Creek. Turbine pumps at the wells lift the water and push it 6 miles through 6-in. pipe to the field where it is used in Forest Oil Corp. floods 2, 3, and 6, and in Pure Oil Co.'s flood.

Producing wells furnish the brine. After separation from the oil the brine is aerated, chemically treated, and filtered. Brine is used in Forest floods 4, 5, and 7, and will be used in future Forest floods 8 and 9.

Booster pumps force the water at 200-128 lb. pressure through a series of cement-lined mains, laterals and individual lines to each of the injection wells. Sand face pressures are kept below the maximum safe pressure of 1 psi. per foot of depth. Daily average injection rates for 1949 average slightly in excess of 1 bbl. of water per foot of exposed sand.

Results obtained.—During the period 1942 through January 1, 1950, Siggins field has produced 3,187,000 bbl. of water-flood oil and, as of January 1, 1950, was producing in excess of 3,000 bbl. daily. Yields per acre are not yet representative of flood value because most properties are far from being flooded out. However, water-flood yields per acre to January 1, 1950, on some leases have been as high as 8,000 bbl.

Production curves of Forest floods (Fig. 4), with all floods shown as though they had been started at the same time, show a gradual decrease in production after the peak is

WATER FLOODS, JANUARY 1, 1950

Line No.	1949 Water flood oil production	1949 Water production	1949 Water input	Avg. input bbl. per day per ft. of pay	Cumulative production and input to January 1, 1950: Water flood oil production	Cumulative production and input to January 1, 1950: Water production	Cumulative production and input to January 1, 1950: Water input	Input water: Type	Input water: Source	Input water: Chemically treated	Flood pay: Net thickness (ft.)	Flood pay: Avg. porosity (%)	Flood pay: Avg. permeability (md.)	At start of water flood per cent of pore space saturated: Oil	At start of water flood per cent of pore space saturated: Water*	Oil characteristics: Viscosity centipoises	Oil characteristics: A.P.I. gravity	Water-flood pattern	Input to oil well distances
1	28,332	10,620	220,264	18.0	28,952	34,605	542,801	Brine	Penn sand	Yes	3.6	....	....	....	....	7.6 at 100° F.	35.4	Perimeter	....	....
2																				
3	30,061	186,520	219,577	10.0	119,942	248,280	402,596	Brine	Produced	Yes	20	19.7	304	22.0	29.0	6.3 at 95° at	32.5	Spot	....	....
4	20,188	3,173	111,227	22.0	20,188	3,173	111,227	Fresh Brine	Run off Penn sand	No	17.1	20.2	265	....	23.6	5.1 at 88° F.	37.6	Flank inj.	....	....
5	29,181	$100,000	2,211,658	2.8	29,181	$80,000	2,719,268	Fresh	Gravel bed	No	38	17.1	168	35.5	42.7	16 at 77° F.	22.4	5-spot	300	....
6	53,700	141,235	2,894,101	2.8	53,700	141,235	3,936,711	Fresh	Gravel bed	Yes	22	18.6	149	33.9	43.4	18.7 at 77° F.	32.0	5-spot	300	....
7	None	8,400	815,600	8.2	None	8,400	815,600	Fresh	Lake	Yes	37	19.0	65	50.6	†26.4	3.5 at 86° F.	38.0	5-spot	660	....
8	3,722	9,273	208,582	18.0	3,722	13,542	252,611	Brine	Cypress sand	No	15.5	19.0	92	....	....	4.2 at 99° F.	37.6	Perimeter	....	....
9	90,877	918	139,241	11.5	166,653	918	235,319	Brine	Tar Springs sd.	No	11	18.0	144	63.0	†15.0	4.6 at 92° F.	36.0	Line	1,500	....
10	33,421	12,575	50,760	9.9	70,389	14,868	102,002	Fresh	Penn sand	No	7	16.0	81	76.0	†18.0	7.5 at 85° F.	35.6	Near 5-spot	500	....
11	None	8,750	39,103	1.5	None	14,504	62,662	Brine	Produced	No	7	15.7	80				37.0	Spot	....	....
12	4,554	1,000	445,000	8.7	4,554	1,000	445,000	Fresh Brine	Gravel beds Produced	No	13	19.0	200	42.0	est.25.0	5 to 6 at 60° F.	31.0	5-spot (irreg.)	....	....
13	61,565	$100,000	1,080,863	3.4	61,485	$100,000	1,080,863	Fresh Brine	Gravel beds Produced	Yes	48	16.6	319	23.6	55	14.7 at 77° F.	29.2	5-spot	300	....
14	32,987	22,917	295,109	1.7	44,037	22,917	364,786	Fresh	Gravel bed	No	52	21.6	....	....	....	.....	....	5-spot (irreg.)	400	....
15	5,116	15,732	62,745	1.9	9,827	31,460	307,690	Brine	Buchanan sd.	No	23	20.0	....	....	....	.....	....	5-spot	....	....
16	41,250	21,000	237,200	3.9	45,000	25,440	342,500	Brine	Penn sand	No	14	21.5	175	60.0	†15	7.0 at 80° F.	33.0	5-spot	300	....
17	29,979	40,128	601,383	3.0	34,400	44,429	714,894	Fresh	Gravel bed	No	22	22.0	....	....	....	.....	....	5-spot	....	....
18	8,461	434	188,304	.6	9,070	434	218,923	Fresh	Penn sand	No	25-45	20.1	....	....	....	....	....	5-spot	....	....
19	280,054	140,263	533,150	8.5	539,086	167,917	1,148,565	Brine	Penn sand	No	15.7	18.5	529	73.0	†17	4.6 at 89° F.	37.3	5-spot	660	....
20	543		230,588	7.0	543	$20,000	230,588	Fresh	Gravel bed	No	23	17.0	20	....	30	.....	38.0	5-spot	....	....
21	2,896	None	14,610	5.7	2,896	None	24,894	Fresh	Gravel bed	No	7	....	....	....	....	.....	....	Spot	660	....
22	13,366	$70,000	234,339	6.0	13,366	$10,000	259,338	Fresh	Gravel bed	No	5	....	....	....	....	....	....	Spot	....	....
23	115,791	92,759	469,486	10.7	315,232	144,458	1,886,225	Brine	Produced	Yes	40	19.2	200	....	25	3.8 at 86° F.	36.8	Line	....	....
24	None	None	13,877	12.3	None	None	13,877	Brine	Tar Springs	No	15	20.0	78	28.0	33	9.3 at 70° F.	37.0	Perimeter	700	....
25	7,978	18,684	71,484	20.0	23,660	23,920	345,844	Brine	Produced	No	10	....	....	....	....	.....	....	Perimeter	....	....
26	†336,000	$2,800,000	$3,900,000		5,405,226	$9,000,000	15,593,206	Brine	Tar Springs	Yes	27	19.0	119	53.0	†20.0	.....	39.0	5-spot	460	....
27	†120,000	$50,000	$300,000		195,378	$50,000	394,994	Brine	Tar Springs	Yes	9	18.8	223	65.0	†30.0	.....	40.0	Perimeter	....	....
28	9,254	7,134	43,343	10.8	24,936	9,306	88,690	Brine	Penn sand	No	11	19.0	85	69.0	†18.0	11.2 at 78° F.	32.2	5-spot	550	....
29	682,574	$1,500,000	3,526,500	1.0	2,497,797	$4,000,000	14,321,908	Brine	Produced	Yes	32	17.5	58	36.7	46.7	8 at 60° F.	36.6	5-spot	300	....
30								Fresh	Gravel beds	No										
31	436,137	836,803	1,543,263	1.6	660,151	1,115,333	4,021,594	Fresh	Gravel beds	Yes	25	18.8	45	29.8	52.2	8.8 at 68° F.	36.0	5-spot	300	....
											6	18.3	66	36.7	52.5	....	....	.....	....	....
	2,510,687	6,118,408	20,612,253	9.9 av.	10,206,891	15,336,179	50,682,976		Averages		20.1	18.9	156	†33.7	†19.8		35.6			

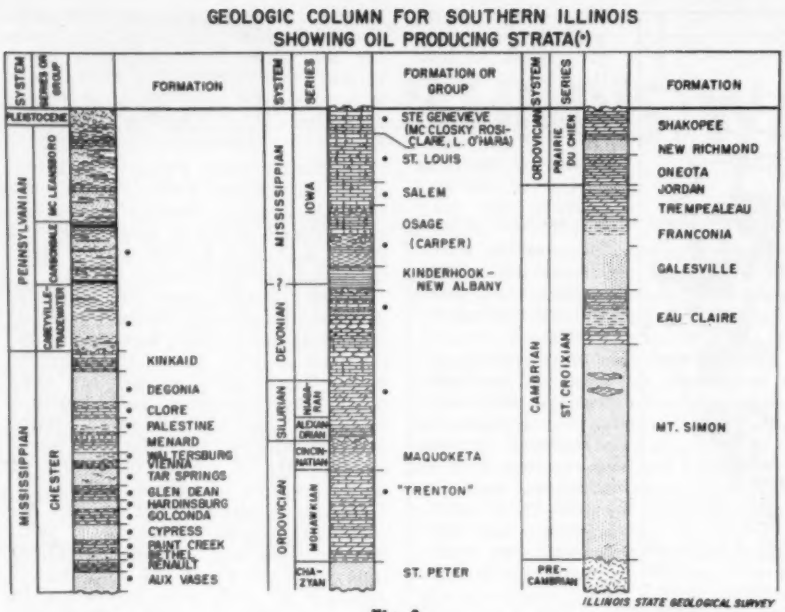

Fig. 2

reached. The marked similarity in decline slope indicates a predictable future life for each flood if present injection and production methods are continued. From the decline rates it seems certain that Siggins floods will continue at a commercial level of production many years after peak production is reached.

Summary.—The Siggins water flood is one of the most successful in the state. At present it ranks third in cumulative water-flood production after the Patoka and basin McClosky floods which rank first and second.

The reservoir characteristics as shown in Table 1, Data for Illinois Controlled Water Floods, January 1, 1950, do not show superior conditions for flooding, but careful evaluation and efficient operating techniques employed are proving successful.

Bellair Water Flood

Introduction.—Bellair field has three pays, the 500 and 800-ft. Pennsylvanian sands, and the 900-ft. Mississippian sand. Only the 500-ft. Pennsylvanian sand is discussed here since it is the only one so far flooded. (See Fig. 5.)

Water-flood history.—The Bellair "500" flood is operated by Forest Oil Corp. and Pure Oil Co., covering 700 acres near the center of the field. Water was first injected in July 1948 and flood production first obtained about the middle of 1949. The daily average production for December 1949 was approximately 550 bbl. of oil.

Water-flood development.—With a few exceptions, old wells were plugged and new wells drilled in a five-spot pattern. Input wells are usually 400 to 440 ft. apart, with input to oil well distances about 300 ft.

Pure's producing wells are completed with casing cemented at the top of the producing zone and wells are flowed through the casing. Input wells are completed by running 1½-in. tubing perforated opposite the pay, filling the annular space to the top of the pay with gravel, and then adding about 5 ft. of sand topped with a few sacks of cement. Casing is then removed from the hole. Forest completes producing and input wells by running 1½-in. tubing with a rag packer cemented opposite the top of the injection interval. Only surface casing is left in the wells. Both companies shoot the sand to even the permeability profiles and equip each input well with a water-flow meter.

Water source and treatment.—Fresh water alone is used in the Bellair flood with approximately 6,656,000 bbl. injected into the sand to the first of January 1950. Water is obtained from gravel beds 100 ft. deep, ½ to ¾ miles southwest of Bellair field. Turbine pumps lift the water and push it through the 6-in. main lines.

Pure Oil uses two diesel engines close to the source wells to raise the

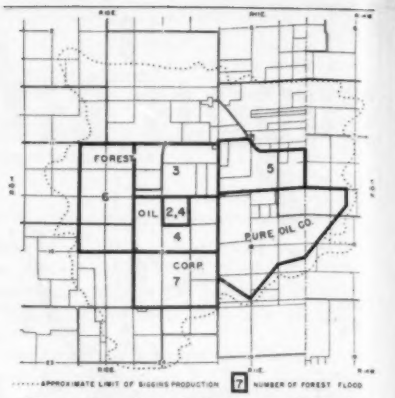

Fig. 3—Location of Siggins pool floods.

pressure to 400 psi., a pressure sufficient to move the water 1½ miles to the filter plant, through the pressure filters, and into the wells at a pressure of about 225 psi.

Forest Oil uses the turbine pumps at the wells to lift and push the water to their booster pump and filter station about 1¼ miles away. Forest's well-head pressures are about 250 psi. Both companies use closed systems with pressure filtrations.

Iron precipitates on the filter elements have caused considerable difficulty. Recently Calgon and calcium hypochlorite treatment have been added by Pure. The 225-280 psi. well-head pressure plus the static head is close to the maximum safe flooding pressure of 1 psi. per foot of depth.

Results obtained.—Because the Bellair "500" flood is new, yields per acre, cumulative production, or other yardsticks of flood productivity are not yet significant. However, a few interesting points of flood behavior of the Bellair "500" are now known.

Production since the start of water flood to January 1, 1950, was 83,000 bbl. with daily production increasing from a few barrels in June to 550 bbl. in December 1949. Water was produced from the start of flood production and had increased to a 70 per cent water cut by January 1, 1950. The production from the wells of Pure which are flowed continuously and from those of Forest, which are flowed intermittently, is similar.

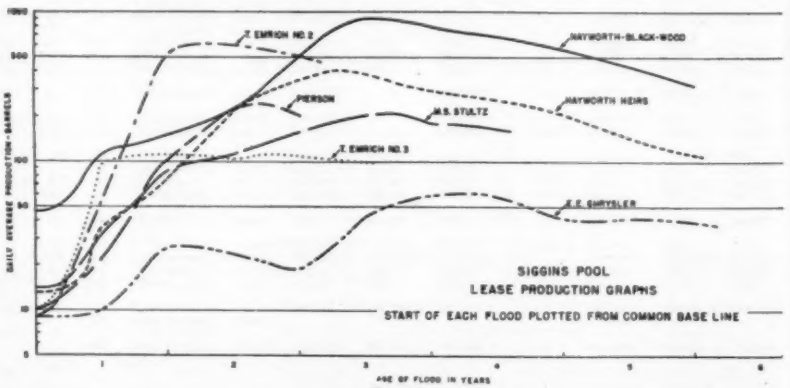

Fig. 4

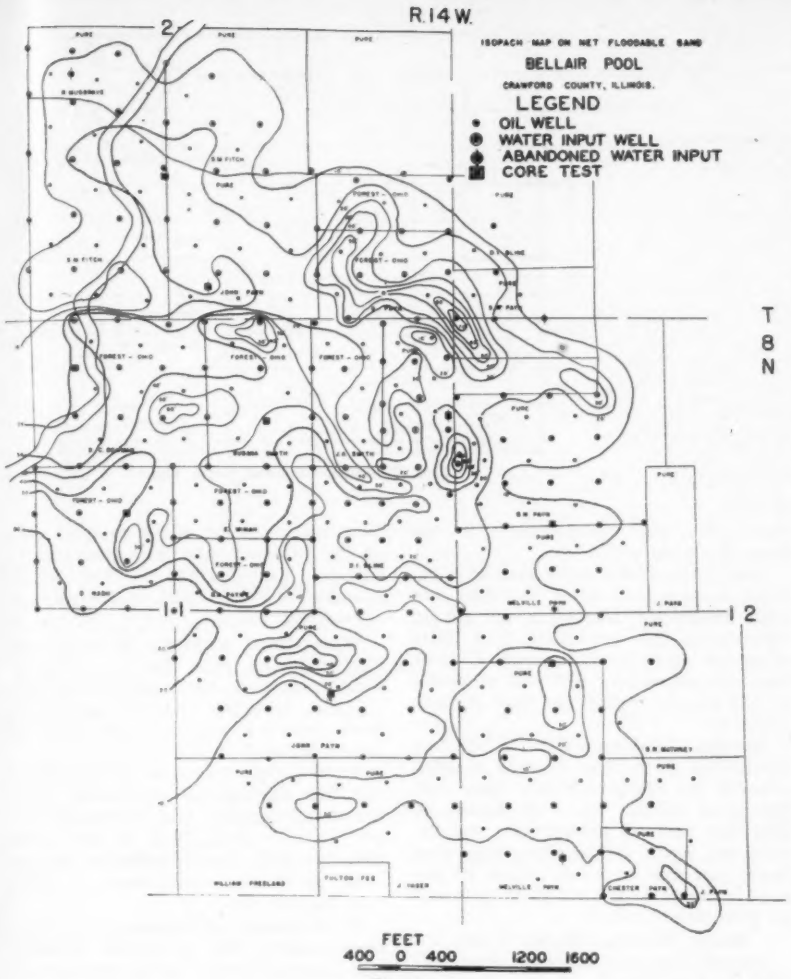

Fig. 5

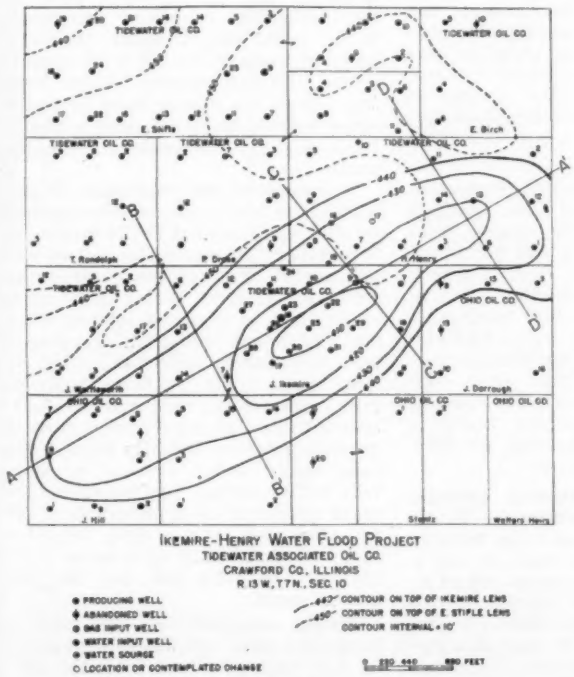

Fig. 6

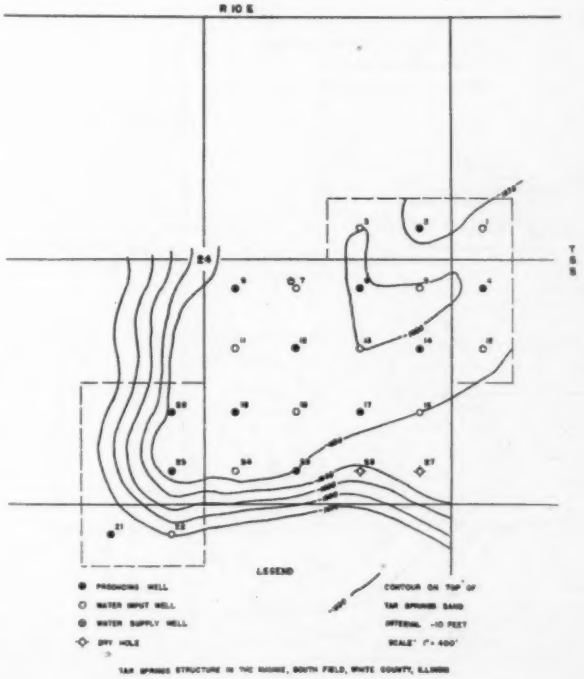

Fig. 7

Ikemire-Henry Lease Flood in Main Pool, Crawford County

Introduction and history.—Oil was discovered in this area in 1906. The Ikemire-Henry lease was developed in 1907 and 1908. Wells had average initial productions of 80 bbl. of oil per day. In 1911 daily production was down to 3 bbl. of oil per well per day. In attempts to increase production, vacuum was used in 1919 and air injection in 1932. These methods recovered 800-1,000 bbl. per acre over a 14-year period. The present Ikemire-Henry water flood was started in 1946.

General geologic conditions.—The Ikemire-Henry flood pay is a small Robinson sand lens ½ by 1 mile, trending northeast-southwest (Fig. 6). Sand thickness ranges from about 35 ft. at the center to zero at the lens edge. The main Robinson sand body underlies the lens and in most places is separated from it by a considerable thickness of shale, but at some places by only a thin shaly sand. The top of the lens is about 940 ft. below the surface.

Water - flood history.—Tide Water Associated Oil Co. first injected water into the Ikemire-Henry lens in February 1948, and flood production was first obtained in August 1948, when production of the 45-acre flood area increased from a few barrels to 35 bbl. per day. By the end of December 1949, the daily average production was 140 bbl. of oil and cumulative water-flood production was 45,000 bbl.

Water-flood development.—A somewhat irregular five-spot pattern is

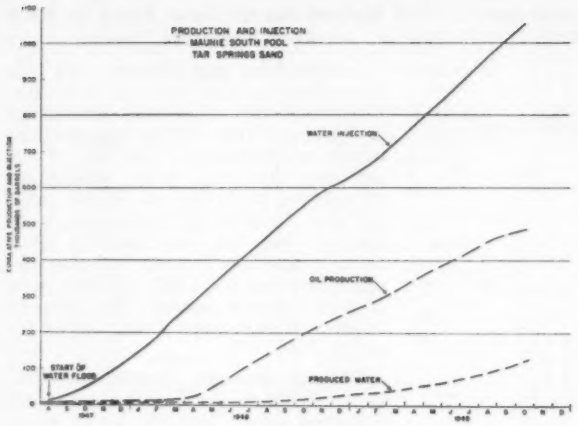

Fig. 8

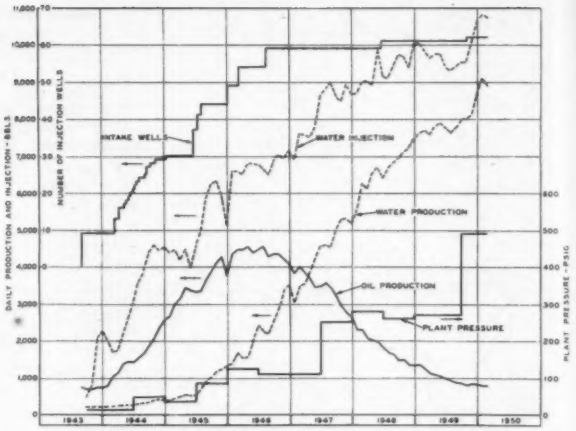

Fig. 10—Patoka Benoist water flood.

used in the Ikemire-Henry lease flood (Fig. 6). Input to input well distances are generally 440 ft.; oil well to input well distances are about 300 ft. Variation in spacing results from the use of a few original wells in the five-spot pattern.

Wells are drilled with cable tools and shot to equalize permeability profiles. Producing wells are completed with 5½-in. casing and pumped through 2⅜-in. tubing. Input wells are completed with 4½-in. casing cemented through the drained upper part of the sand. Individual meters are used on input wells.

Water source and treatment.—One old oil well deepened to a basal Pennsylvanian sand at 1,200 ft. has furnished the entire 342,500 bbl. of water injected into the Ikemire-Henry lens to January 1, 1950. A conventional oil-well pump is used to lift the water and distribute it to the nine injection wells.

Iron precipitates have caused a reduction of intake rates at times, but acid treatment has been an aid in remedying this condition. The daily injection rate as of January 1, 1950, was approximately 670 bbl. of water at 130 psi., or 4 bbl. per foot of sand per day.

Results obtained.—By the end of December 1949, the 45-acre flooded area of the Ikemire-Henry lease had produced 45,000 bbl. of flood oil and the rate of production was increasing each month. The per cent water cut has increased, from 38 per cent in September 1948 to 51 per cent in December 1949.

South Maunie Water Flood

Introduction and history.—Since the discovery of South Maunie field in 1941, 10 pays have been found in the Pennsylvanian and Mississippian systems. Only the water-flooded sand, the Tar Springs of the upper Mississippian, is discussed here.

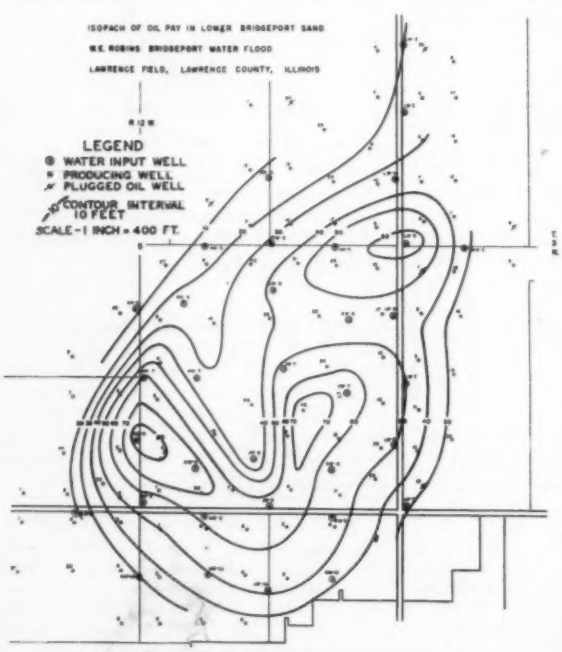
ISOPACH OF OIL PAY IN LOWER BRIDGEPORT SAND
W.E. ROBINS BRIDGEPORT WATER FLOOD
LAWRENCE FIELD, LAWRENCE COUNTY, ILLINOIS
R 12 W
LEGEND
WATER INPUT WELL
PRODUCING WELL
PLUGGED OIL WELL
CONTOUR INTERVAL 10 FEET
SCALE - 1 INCH = 400 FT.

Fig. 9

Initial production from Tar Springs wells ranged from 10 to 500 bbl. of oil per day. Primary production from the Tar Springs is not accurately known because production from the many pays was not separated, but it is estimated at 486,000 bbl.

General geologic conditions.—South Maunie Tar Springs reservoir is on a northeast-southwest elongated rise with little closure, 25 ft., and of varying sand thickness, 10-30 ft. It is about 20 miles southeast of the deepest part of the Illinois basin. The structurally highest Tar Springs in the South Maunie field is 1,820 ft. below sea level (Fig. 7).

Water-flood history.—Water was first injected into the Tar Springs sand August 11, 1947, and by January 1, 1950, 1,148,565 bbl. of water had been injected into the 230 acres of water-flooded sand.

Immediately prior to water flooding, Tar Springs oil production from the flood acreage was about 40 bbl. per day; in July 1948, it was 1,040 bbl. per day. The cumulative water-flood production to January 1, 1950, was 528,086 bbl.

Water-flood development.—A five-spot pattern was made by converting alternate wells of a regular 10-acre spacing to water-input wells (Fig. 7). This arrangement puts input wells 930 ft. apart and input to oil wells 660 ft. apart. Water is injected through tubing with upside-down hookwall packers. Water lines and tubing are plastic lined and each input well is equipped with a meter. Producers are conventional pumping wells.

Water source and treatment.—Water is obtained from a Pennsylvanian sand by one well located in 24-6s-10e. In September 1948 this water source was augmented by returning produced water to the sand. Water injection is maintained in a closed system without treatment although occasional acid treatments have been used to clean tight wells. A Reda pump is used in the source well and two horizontal triplex plunger pumps furnish the line pressure. Initially input wells took water under vacuum or with very little pressure. In December 1949 plant pressures of approximately 800 psi. were used and a daily injection rate was maintained of close to 1,550 bbl., or about 8.5 bbl. per day per foot of sand.

Results obtained.—By the end of December 1949, 528,086 bbl. of flood oil had been produced from the 230-acre flooded area. This is approxi-

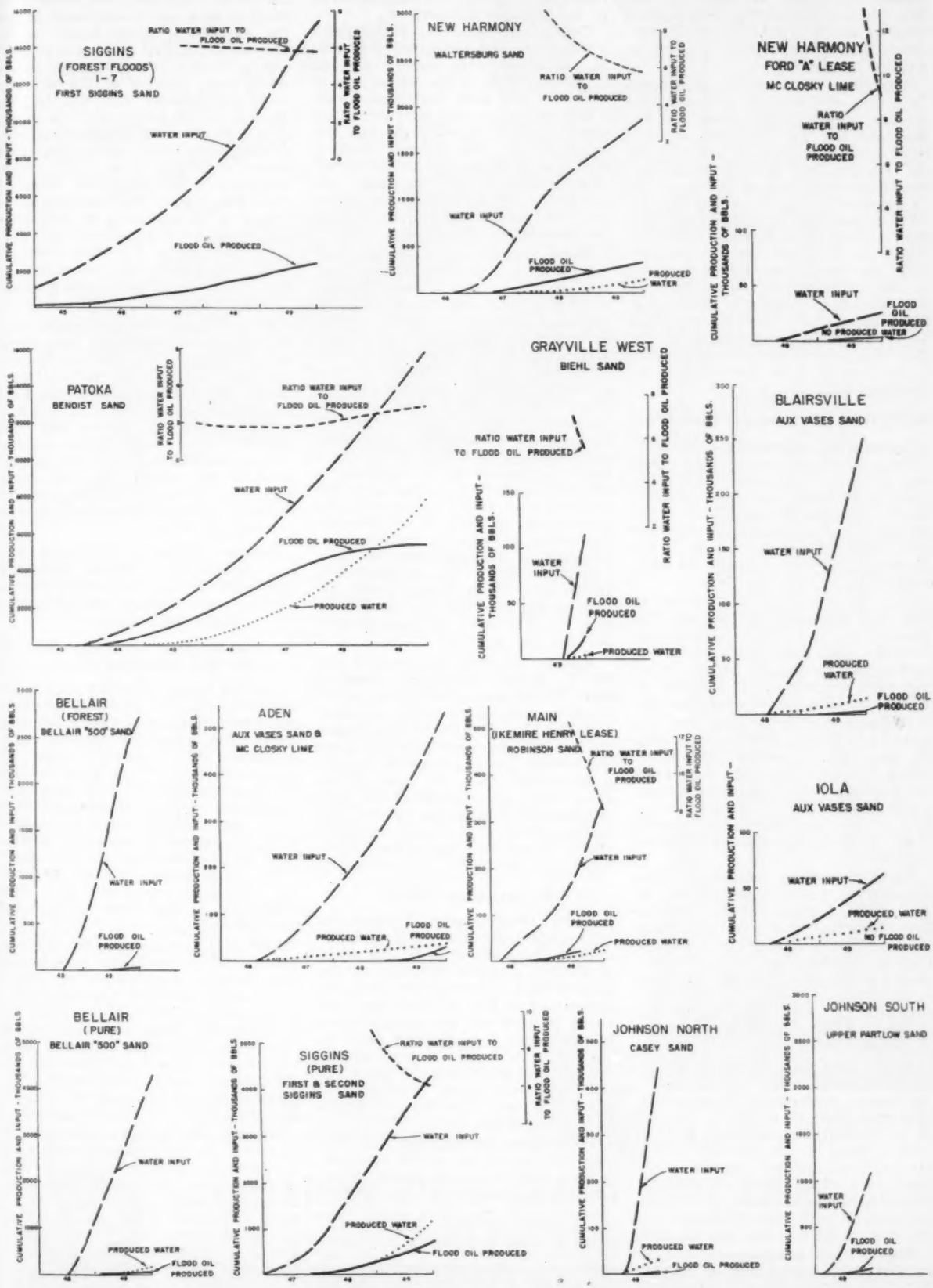

Fig. 11—Graphs of water input and oil produced by water flooding.

mately 2,300 bbl. per acre, or 144 bbl. per acre-foot. Daily average production has remained high with cumulative production showing a constant rate of increase.

Summary.—The Tar Springs flood in South Maunie field was the first 10-acre spacing sand flood in Illinois and the first in Illinois to convert producing wells to input wells. Its success has greatly influenced water-flood procedures in the state, because of the great saving in cost of the operation in comparison with the drilling of new wells for input wells and of closer spacing of wells. The secondary recovery to January 1, 1950, of 528,086 bbl. is greater than the primary production of 486,000 bbl. The success of the South Maunie flood is of particular importance to the new fields of Illinois where there is much pay sand of similar physical characteristics.

W. E. Robins Bridgeport Water Flood

Introduction and history.—The W. E. Robins Bridgeport water flood is being operated by Ohio Oil Co. in Lawrence field, Lawrence County, Illinois. The flooded zone is the lower Bridgeport sand. The part of the flood now active covers the whole of the Robins lease which occupies the SE¼ 5-3n-12w.

The first Bridgeport producer in this area was completed in 1906. The Robins lease was developed between 1909 and 1913. The initial production of the wells averaged 80 bbl. of oil per day, but production dropped off rapidly to a few barrels of oil per day.

Repressuring by air and gas was used from 1944 to 1948 in an attempt to increase production. Production which had been 450 bbl. per week for the lease was increased to a maximum of 900 bbl. per week as a result of the operation. The present flood on the Robins lease was started in 1948.

General geologic conditions.—This water-flood pay is located on the eastern flank of the LaSalle anticline just downdip from the crest. The sand thickness ranges from a few feet to slightly over 100 ft. in the center of the lease. On the west side of the lease the sand body is largely replaced by shale. The top of the lower Bridgeport sand is about 900 ft. below the surface.

Water-flood history.—Ohio Oil Co. first injected water in the lower Bridgeport sand on the Robins lease in August 1948 and a definite increase in production was noticed by April 1949. A total of 1,306,585 bbl. of water had been injected into the 29 intake wells of the flood by July 31, 1950. An estimated 35,000 bbl. of water-flood oil have been produced from the start of the flood to July 31, 1950.

Water - flood development.—An irregular five-spot pattern is used in the Robins flood. The distance between wells is quite variable as a result of including the original wells in the five-spot pattern.

The intake wells are drilled with a rotary rig and completed with 4½-in. casing set with cement through a depleted zone in the upper part of the sand. The wells are cleaned with a wall-scratcher prior to water injection. Water is injected through the 4½-in. casing. Each injection well is equipped with an individual meter. The producers on the lease are pumped, some from a central power unit and others from individual units powered by electric motors.

Water source and treatment.—During the early part of the flood, water was supplied from a well in the Buchanan sand, and injected into the reservoir through a closed system without treatment. Since October 1949, a fresh-water well in alluvial gravels along the Embarras River 6 miles north of the lease has supplied the water for the flood. The water is pumped through a pressure filter en route to the intake wells. The water system is closed. No chemical treatment is used. Water is supplied to the well-heads at pressures up to 325 psi., but most of the intake wells receive water at little or no pressure. Reduction of intake rates due to plugging of the sand face has been corrected by the use of scratchers. Intake rates range from 0.5 bbl. per foot of sand per day to 10 bbl. per foot per day with an average of 5 bbl. per foot per day.

Results obtained.—Because the W. E. Robins Bridgeport flood is new, the ultimate productivity of the flood is difficult to estimate. Since the start of the flood in 1948, 95,000 bbl. of oil have been produced from the Robins. Daily production has almost tripled since the start of the flood although fillup has not been attained in all segments of the flood pattern. Fluids produced averaged about 30 per cent water during the month of July 1950.

Patoka Water Flood*

Water - flood history.—Patoka was discovered in February 1937, and was developed by 132 wells on 700 acres. A history of water flooding in the Benoist sand of Patoka field is shown graphically in Fig. 10. This flood was begun in 1943 and the first increase in production was realized early in 1944. A slight increase over immediate preflood production of about 700 bbl. daily still exists. Peak production by primary recovery was slightly over 2,000 bbl. daily.

Water-flood development.—By August 1946, 59 intakes and 39 new producing wells were completed. Forty off-pattern wells in the original drilling were abandoned, and three were plugged back and recompleted in the Tar Springs as brine supply wells. The water-flooding pattern is in general a 10-acre five-spot with somewhat wider spacing at the extreme north and shorter and less regular spacing in the south near the town of Patoka. The final water-flood development included the drilling of 62 intake wells and 40 oil wells, which combined with the wells retained from the original development gives a total of 80 producers on 566 acres. All wells were completed with cemented-in casing. Flooding water is being introduced into the casing in input wells and the oil wells pumped through tubing in the usual way.

Water source and treatment.—The flooding water is obtained from three wells completed in the Tar Springs sand, one of which is capable of producing 15,000 bbl. per day. The supply and produced water is aerated, settled, chemically treated, and then filtered. Water in sufficient volume at first entered the sand with a vacuum on the casing. The line pressures were advanced as increasing resistance was encountered until it now operates at 500 psi.

Results obtained.—The entire water injected as of March 1950 was 16,300,000 bbl. and the cumulative oil produced was 5,451,000 bbl. This ratio of 2.9 is unusually good.

*The complete history of Patoka field both primary and flood production, was given by Hugh S. Barger in his article in the May 25, 1950, issue of The Oil and Gas Journal. A summary description is included here because the operation was skillfully designed and operated and the results in oil production were spectacular.

Conclusions from a Comparison of the Six Described Floods

The six floods described have some notable similarities. Probably the most important of these is that much was known concerning the physical characteristics of the reservoir rocks and fluids before the floods were started. Other similarities are that all of the floods are pattern floods and that flood development covers an extensive area. Some of the more important dissimilarities are different operating techniques, different geologic ages of flood pays, and the great difference in the term of primary production.

The data given above for the six floods will be useful in considering the flooding possibilities of other areas where some information on reservoir characteristics is available. In addition the behavior of these six floods should furnish a sound basis on which to check computations on fillup time, water requirements, oil production, and life of flood production once a flood project is started.

General conclusions.—Although all of the 31 controlled floods tabulated in this report were started since 1942, 5 out of the 7 Chester (upper Mississippian) sand zones and the 2 most important lower Mississippian producing zones now have water floods in operation. These Mississippian floods plus the 15 floods in the many Pennsylvanian sands give Illi-

(Continued on page 66)

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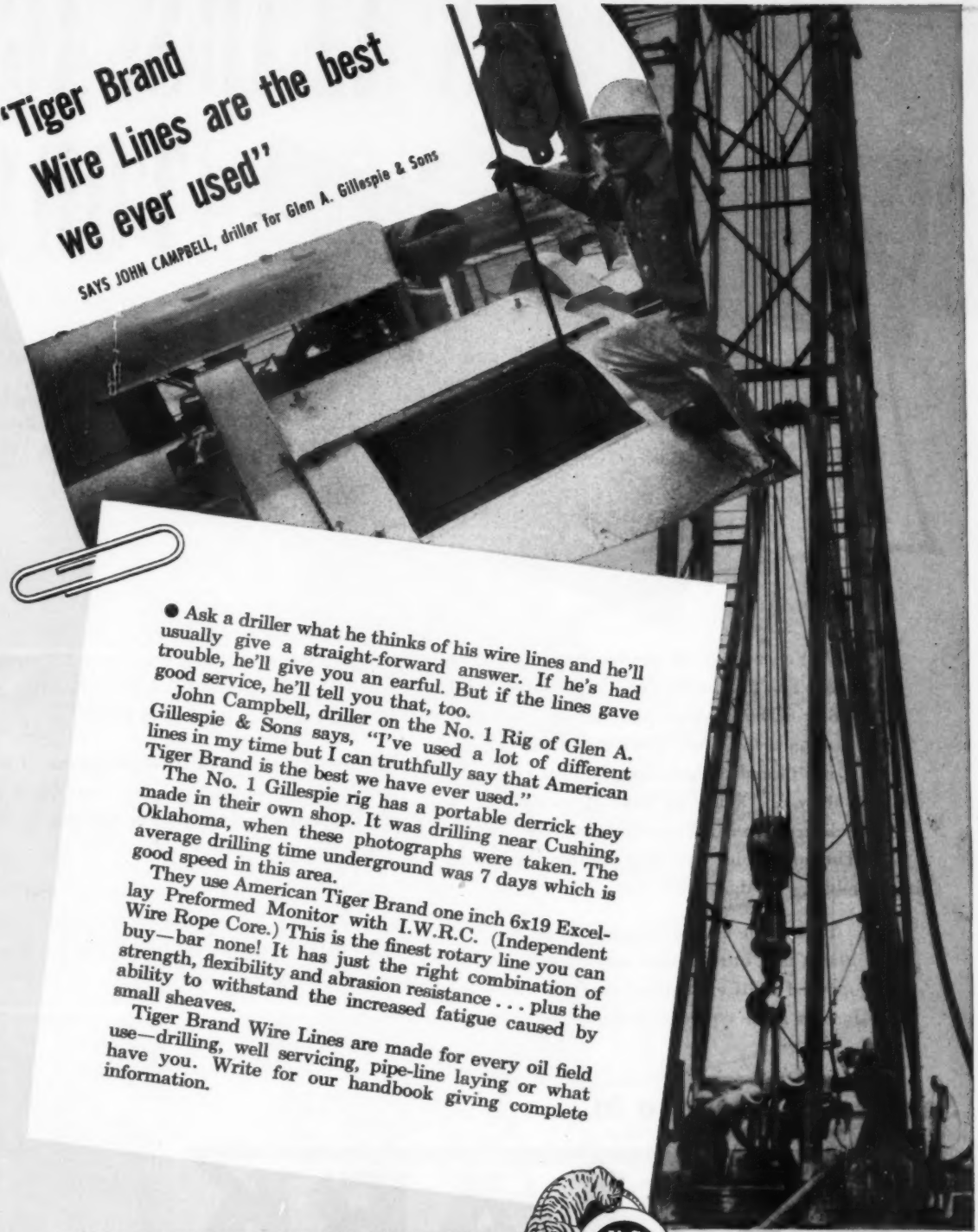

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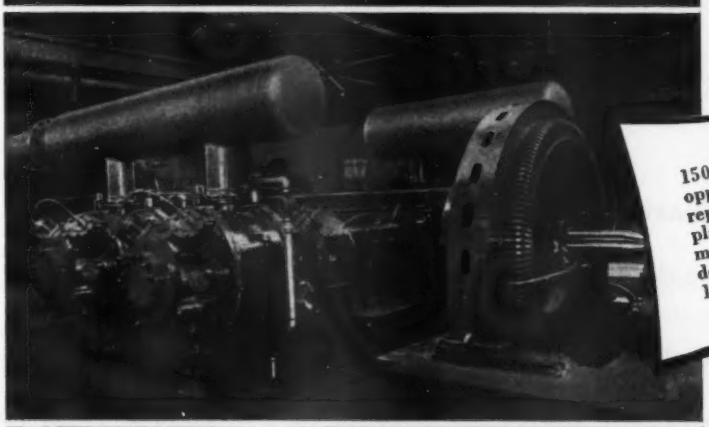
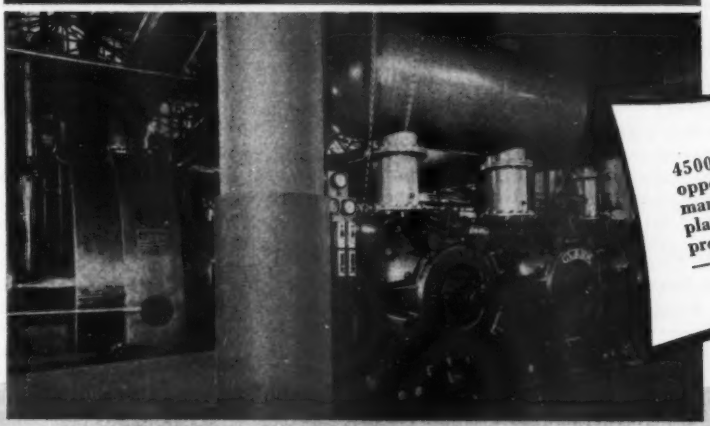


1500 BHP Clark CBA-4, balanced-opposed motor-driven compressor now replacing several units in furnishing plant air for famous Detroit automobile manufacturer. (Two additional units under construction.) Discharge pressure 100 psig. Capacity 8400 CFM.



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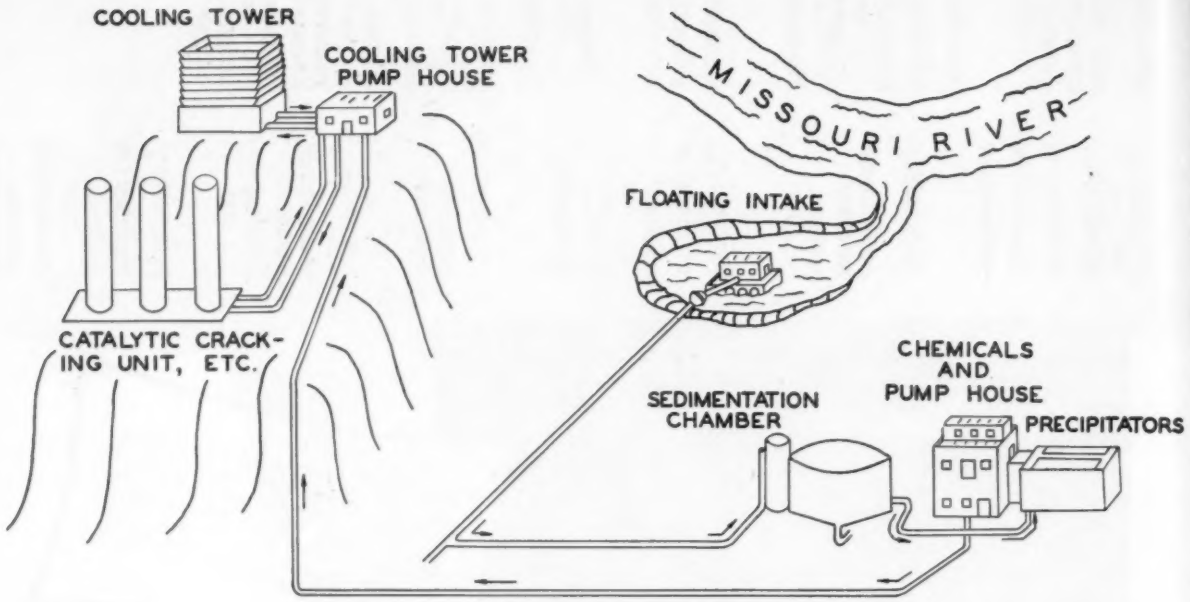


Fig. 1—Abridged diagram of cooling-water system.

How Standard of Indiana achieves

Stabilization of Cooling-Tower Water

at its Sugar Creek Refinery

by Hobart Shields and L. V. Sorg

Process clarifies water to turbidity of 10 p.p.m. or less, and adds chemicals that stabilize water so that scale deposition or corrosive attack will not occur in admiralty and iron tubes of coolers served by water

ENLARGEMENT of the Sugar Creek refinery of Standard Oil Co. (Ind.) required the installation of an induced-draft cooling tower to furnish a maximum of 30,000 g.p.m. of 70°-90° F. water for use at the catalytic cracking unit and in associated equipment. To supply makeup water for the cooling tower, 3,000 g.p.m. is taken from the Missouri River and treated in a cold-process clarification plant, which provides for primary sedimentation, flocculation, precipitation, and chemical treatment.

Design of this plant was based upon pilot-plant data obtained with water typical of the Missouri River except at flood stages. Requirements of the process are to clarify the water to a turbidity of 10 p.p.m. or less, and to add chemicals that will stabilize the water so that scale deposition or corrosive attack will not occur in the admiralty and iron tubes of the coolers served by the cooling-tower water. Any water softening that occurs is incidental.

Process Flow

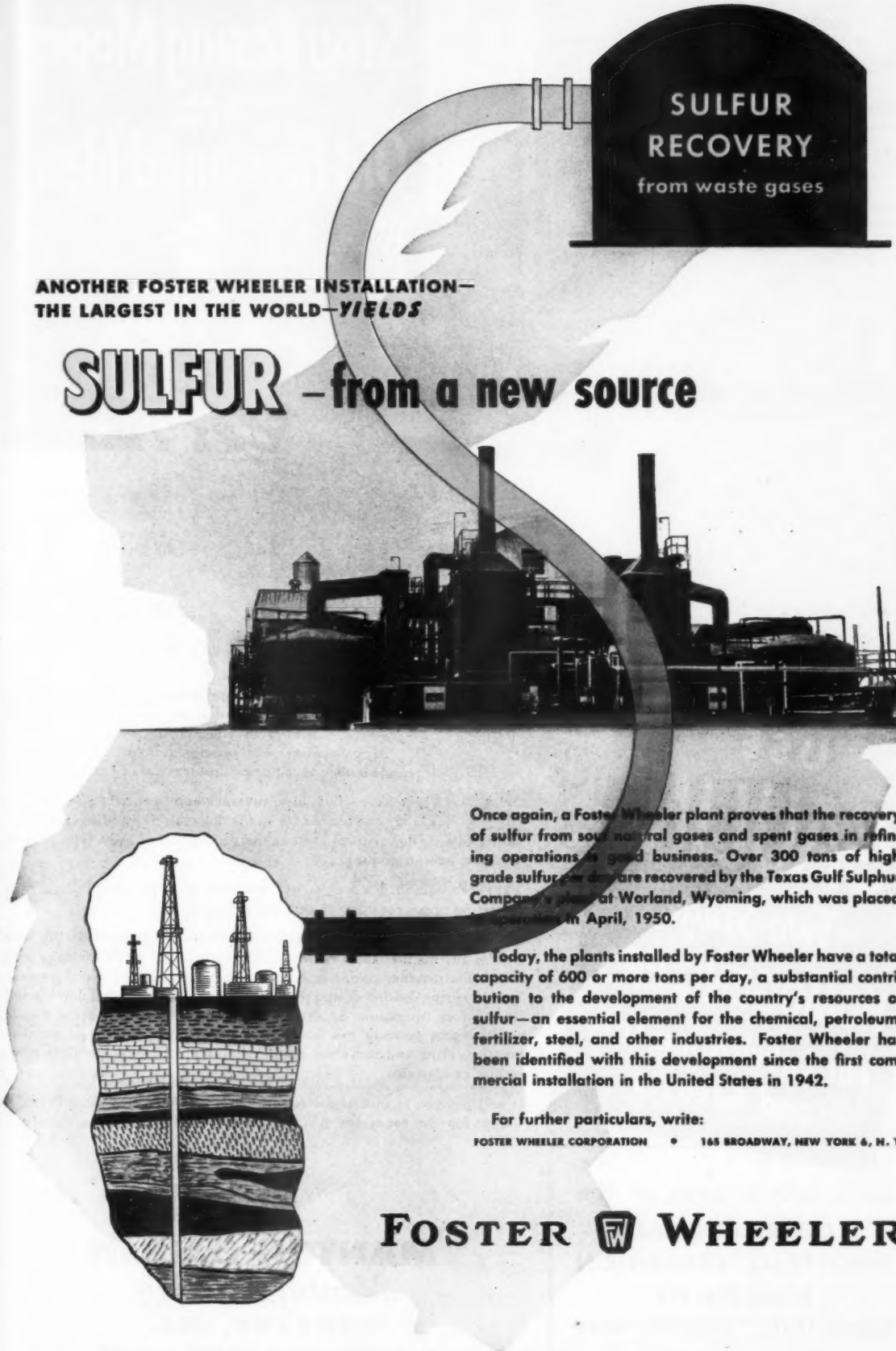
The cold-process clarification plant consists of a primary-sedimentation chamber and two horizontal-type precipitators, together with the necessary facilities for pumping, mixing, and addition of chemicals. The process flow, depicted in Fig. 1, may be outlined as follows:

Primary sedimentation. — Missouri River water, which may vary from 100 to 50,000 p.p.m. in turbidity, flows from a floating intake through a mixer, where chemicals may be added to aid clarification, to a sedimentation chamber where most of the suspended solids are removed.

Chemical coagulation.—The partially clarified water picks up coagulating agents from the chemical feed tanks en route to two precipitators, which may be operated in either parallel or series flow. Here flocculation and sedimentation occur. An economic consideration of water-clarification processes dictated the use of lime as the principal agent. Attendant to this use is a desirable partial softening of the water. As an auxiliary flocculating agent, alum was initially chosen, but operating pH levels required an agent more compatible with the higher alkalinities encountered. A commercial hydrated ferric sulfate was found to be suitable and has been used continuously.

Stabilization against corrosion and scale deposition.—At the outlet from the precipitators, the clear water is adjusted for pH and stabilizing chemicals are added in the correct amount. An alkaline antiscale, anticorrosion agent selected for initial trial consisted of a commercial blend of selected polyphosphates, soda ash, and lignin sulfonate. It was used upon the manufacturer's recommendation at a pH level of 8.1 to 8.5 and in a concentration of 6.0 p.p.m., as phosphate, in the makeup water.

Process use.—The stabilized water is pumped to the cooling tower through a 16-in. line at the rate required for makeup purposes. The



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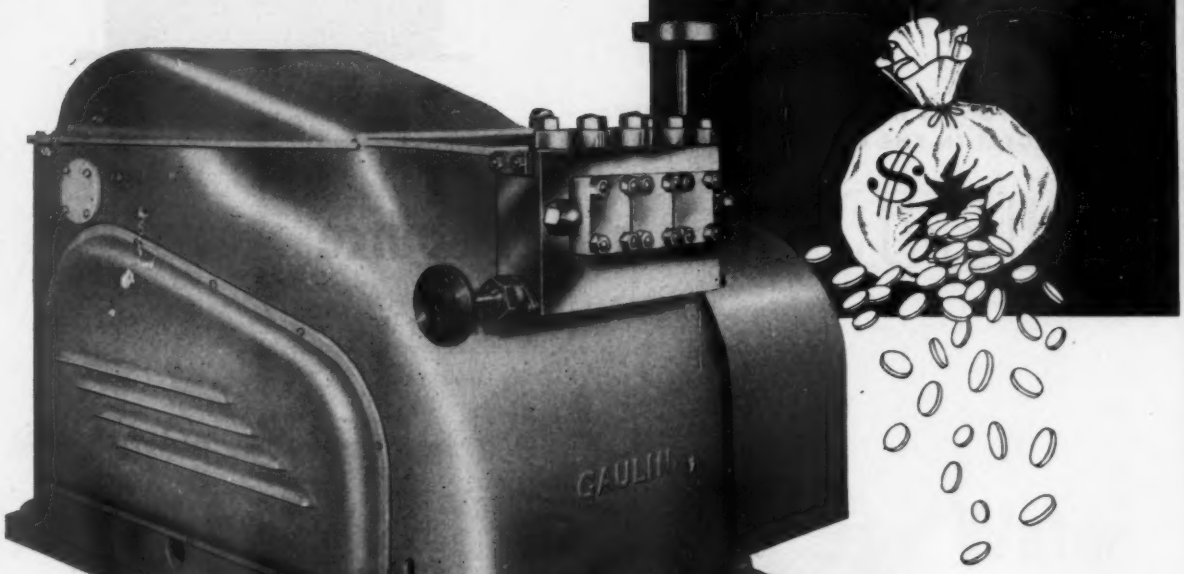

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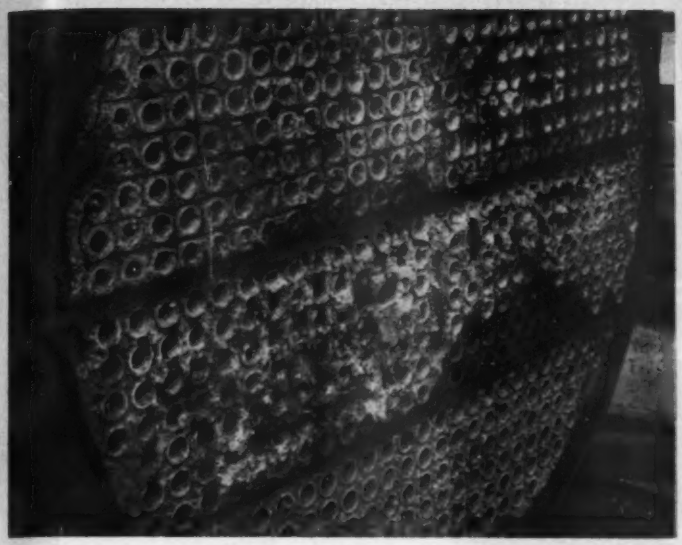

Fig. 2—Lean-oil cooler after 10 months of operation with phosphate stabilized water.

Fig. 4—Pilot-scale cooling tower.

cooling-tower grade is 171 ft. above the water-treating plant and ¾ mile away. Water from the cooling tower, at 70°-90° F., flows through a 42-in. line to the catalytic cracking area, 57 ft. below the cooling tower. Water is returned to the cooling tower at a temperature of about 112° F.

Alkaline Water-Stabilization Agents

The treating plant has been shown to handle a decidedly variable water influent and to produce therefrom a clarified, partially softened, largely uniform effluent. Data to demonstrate this over a 1-year cycle, in which polyphosphates in the alkaline range were used, are shown in Table 1.

Despite wide fluctuations in the raw-water turbidity, it was possible to produce a water well below the 10-p.p.m. maximum turbidity specification. The use of lime in most cases reduced the hardness of the water by about 25 per cent. As indicated by the phenolphthalein alkalinity, lime control was satisfactory. Likewise, the pH was controlled within limits (8.7-10.0) that yielded an 8.1-8.5 pH in the cooling-tower basin. These data support the belief that optimum conditions for the use of this water-conditioning agent have prevailed and that the situation next to be described is the result of the inability of this agent to provide adequate protection of metal surfaces.

A number of indexes for the performance of the water-stabilization agent have been thoroughly followed. One of the most revealing has been the regular examination of scale-test specimens exposed to cooling-tower circulating water. The specimens consist of admiralty or iron exchanger tubes, closed at one end and mounted in a section of 2-in. pipe which serves as the exchanger shell.

Water from the cooling tower is circulated in the annular space between the tube and shell of the exchanger at a controllable rate to attain the desired outlet-water temperature of 150° F. by heat transfer from 12-lb. steam (240° F.) within the tube portion of the test exchanger. The tube is removable from the test exchanger so that it can be examined, weighed, cleaned, and returned to service. Accelerated test conditions are maintained for a period of at least 1 week, with regular attention and adjustment.

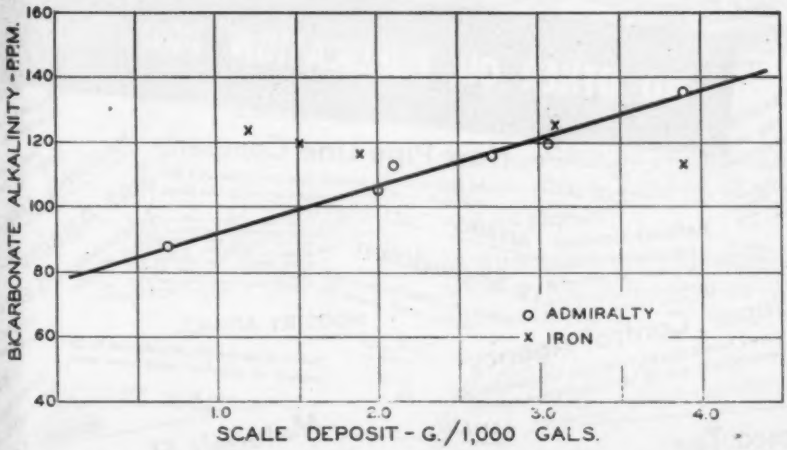

Fig. 3—Correlation between bicarbonate alkalinity and scale deposition.

Results from the examination of test specimens are expressed as grams of scale per 1,000 gal. and grams of corrosion loss per 1,000 gal.; representative data are shown in Table 2. For normal variations in water conditions, the data conclusively show scale formation on admiralty and both corrosion and scale formation on iron. At higher cycles of concentration, which should favor the use of polyphosphates, actually more scale was formed and the corrosion of iron was greater. Although such data do not quantitatively represent conditions in the full-scale plant equipment, they have been found to provide an adequate indication of prevalent corrosion and scale formation.

After 10 months of operation, a number of product and stream coolers showed signs of fouling. Flow in these coolers was so restricted that outlet-water temperatures were as high as 130° F., compared with the design temperature of 105° F. Examination showed many tubes to be plugged. One of the worst conditions was encountered in a lean-oil cooler, as illustrated in Fig. 2. Evidences of fouling led to examination of the cracked-gasoline cooler at the catalytic cracking unit after 13 months in service. The steel tubes were badly corroded and so plugged with corrosion product as to reduce the efficiency of the cooler by 50 per cent.

After 15 months of operation, a concentric-tube cooler for light naph-

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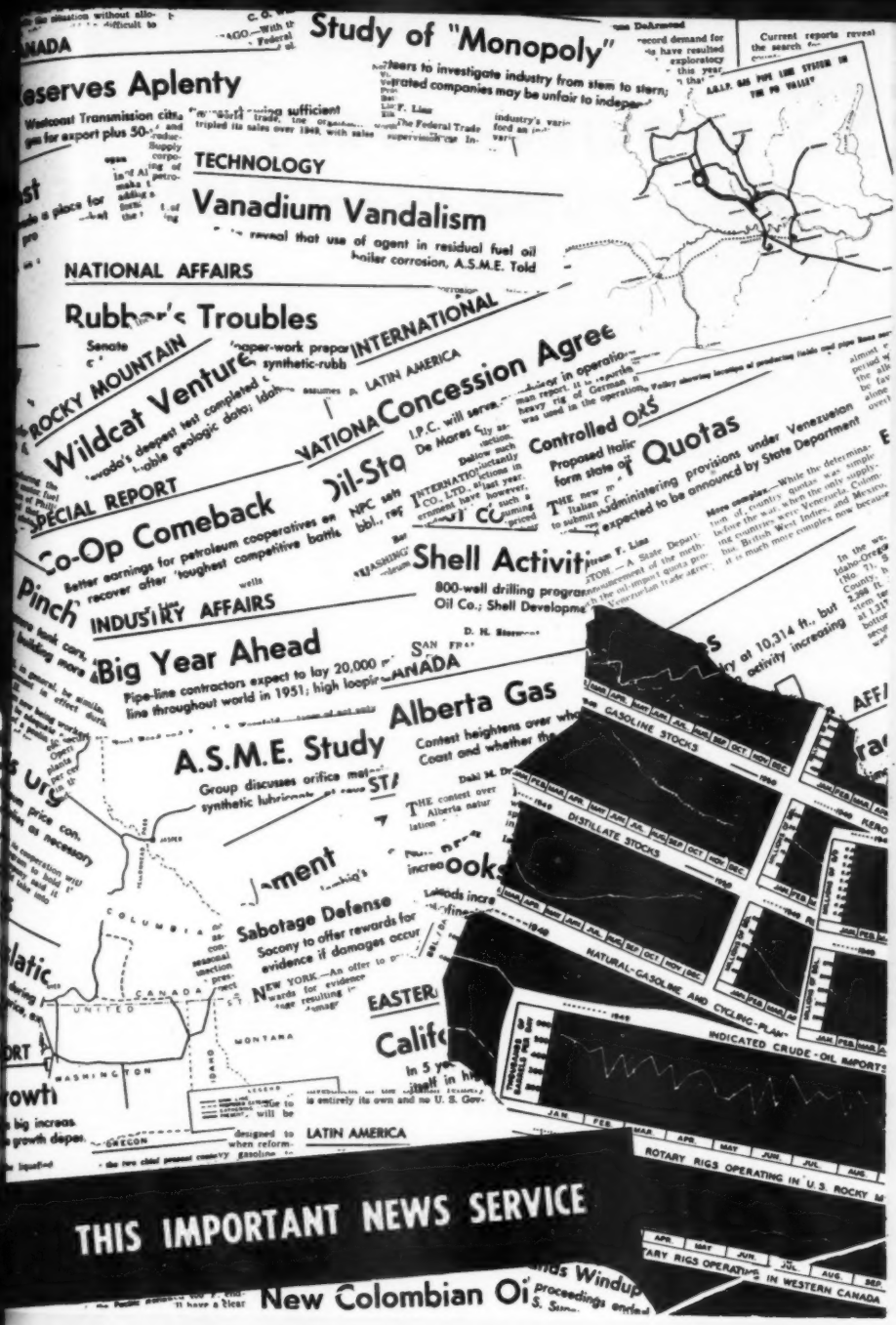

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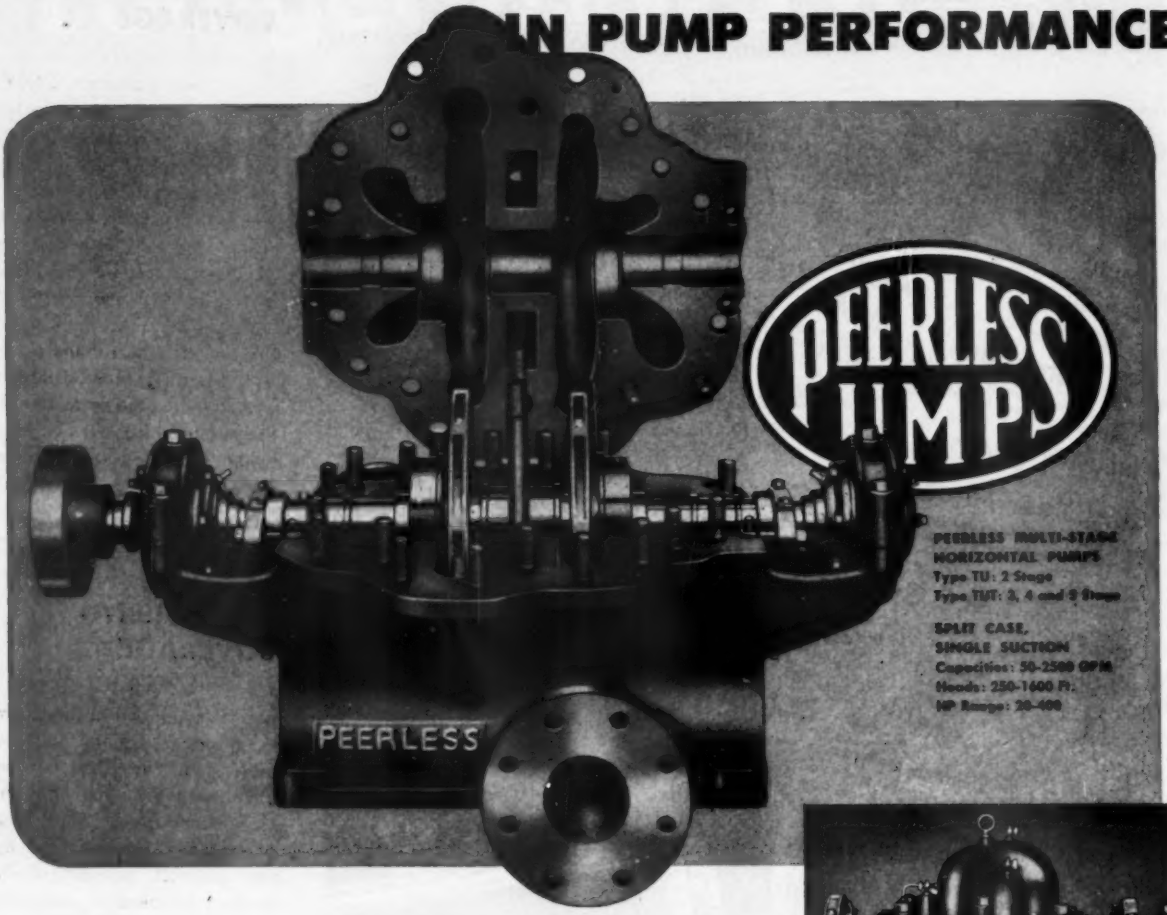

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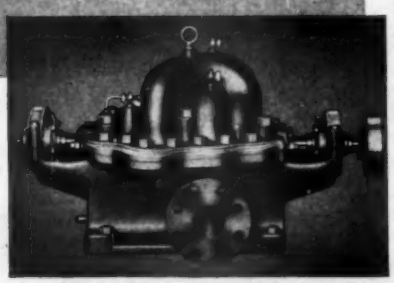

Exterior view of Type TU 2-stage pump showing internal cross-over as furnished on 4" size and smaller.

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TABLE 1—CHARACTER OF RAW AND TREATED WATER

Water—	January		March		May		July		September		November	
	Raw	Treated	Raw	Treated	Raw	Treated	Raw	Treated	Raw	Treated	Raw	Treated
Turbidity, p.p.m.	240	12	1,600	15	1,220	12	1,100	9	600	6	250	6
Total dissolved solids, p.p.m.	...	393	....	260	....	450	....	350	....	....	....	....
Hardness (as $CaCO_3$), p.p.m.	...	140	170	147	235	180	165	120	210	160	240	185
Alkalinity (as $CaCO_3$), p.p.m.:												
To phenolphthalein	...	28	0	9	0	12	0	9	0	10	0	15
To methyl orange	...	54	120	72	160	64	125	55	145	50	175	60
pH	...	10.0	....	8.7	....	9.0	....	9.2	....	8.7	....	9.3
Calcium (as $CaCO_3$), p.p.m.	...	115	....	107	....	130	....	85	....	120	....	130
Magnesium (as $CaCO_3$), p.p.m.	...	25	....	40	....	50	....	35	....	40	....	55
Sulfate (as Na_2SO_4), p.p.m.	...	240	....	190	....	336	....	190	....	215	....	260
Chloride (as NaCl), p.p.m.	...	46	....	30	....	38	....	45	....	50	....	55

tha was likewise found to be badly fouled with corrosion product. Subsequent examination of the water jackets on the air compressors at the catalytic cracking unit showed rusting, particularly at the water-exit ports. The inability of polyphosphates in the alkaline range to prevent corrosion and scale formation in iron equipment was confirmed.

Inadequate protection provided by alkaline polyphosphates led to an investigation with two objectives: (1) to determine the best control method while alkaline polyphosphates continued to be used, and (2) to evaluate on a pilot-plant basis a wide range of additional water-stabilization agents.

Interim Control of Water Stabilization

The Ryznar[2] and Langelier[1] indexes are recognized methods for indicating water stability. For Sugar Creek conditions, a Ryznar index at 176° F. of 5-6 is supposed to indicate no scale formation or corrosion in the presence of polyphosphates. A plus Langelier index is supposed to indicate scale-forming properties in proportion to the magnitude of the difference between the number and zero, but no corrosion. Reference to the condition of the test specimens reported upon in Table 2 shows that neither of these indexes is valid for Sugar Creek water.

Guidance in the stabilization of water while other compounds were being investigated was provided by a correlation of bicarbonate alkalinity and scale formation. This is shown in Fig. 3 for the water treated at Sugar Creek. Since initial scale formation was shown to occur in the range of 75-80 p.p.m. of bicarbonate

TABLE 2—EXAMINATION OF TEST SPECIMENS
(Polyphosphate treatment in the range 8.1-8.5 pH)

Condition of test specimen:	Test number 16	19	21	24	52	54
Admiralty:						
Scale, g./1,000 gal.	1.1	1.2	3.9	2.1	4.7	5.8
Corrosion,* g./1,000 gal.	0.0	0.0	0.0	0.0	0.0	0.0
Iron:						
Scale, g./1,000 gal.	2.2	1.2	3.2	3.9	5.0	5.6
Corrosion,* g./1,000 gal.	3.1	1.6	6.3	2.0	4.5	1.2
Test conditions:						
On test exchanger:						
Inlet water, °F.	72-76	72-76	72-76	75-80	77-83	80-85
Outlet water, °F.	148-155	150-155	145-155	140-150	145-155	145-155
Water flow, g.p.m.	0.014	0.059	0.049	0.071	0.032	0.054
On circulating water:						
Total solids, p.p.m.	800-900	1,000-1,100	1,100-1,200	1,500-1,600	1,400-1,500	1,500-1,600
pH	8.1	8.0	8.1	8.2	8.4	8.7
Polyphosphate, as PO_4, p.p.m.	5.0	4.5	7.7	3.7	5.0	7.0
Cycles of concentration	2.5	2.5	3.4	4.9	3.5	3.4
Sulfate, as Na_2SO_4, p.p.m.	650	550	750	1,100	1,000	1,000
Ryznar index, 176° F.	5.3	5.4	5.6	5.5	...	4.7
Langelier index, 176° F.	+1.4	+1.3	+1.2	+1.4	+1.5	+1.9

*Metal loss.

TABLE 3—SUMMARY DATA FROM PILOT-PLANT INVESTIGATION

Condition of test specimen:	Polyphosphates A	B	C	Glucose derivative D	Metaphosphates E	F
Admiralty:						
Scale, g./1,000 gal.	1.68	1.58	0.46	0.46	3.37	3.43
Corrosion, g./1,000 gal.	0.22	(*)	0.0	0.0	0.0	2.10
Iron:						
Scale, g./1,000 gal.	1.30	4.01	1.76	0.28	2.30	3.02
Corrosion, g./1,000 gal.	0.26	1.67	0.78	0.0	0.0	0.20
Test conditions:						
On test exchanger:						
Inlet water, °F.	80-90	70-80	75-85	70-80	70-80	70-80
Outlet water, °F.	150	145-160	150-160	145-165	150	150
Water flow, g.p.m.	0.317	0.305	0.345	0.574	0.229	0.165
On circulating water:						
Total solids, p.p.m.	1,410	1,881	1,034	1,300	1,490	1 213
pH	8.1	8.36	8.17	8.3	6.2	6.2
Phosphates (PO_4), p.p.m.	3.3	6.0	4.5	3.0	42	29
Sulfates (Na_2SO_4), p.p.m.	822	1,183	578	800	982	810
Chromates (CrO_4), p.p.m.	81	....	18	6.0	....	....
Cycles of concentration	3.1	4.2	3.0	3.5	4.0	3.2
Langelier index, 176° F.	+1.0	+1.2	+0.9	+1.25	....	....
Vendor's recommended concentration, p.p.m.	....	8.0	35.0	quachrome glucosate: 16 tetraphospho glucosate: 10	15-20†	30-35

*Quantitative data not available. †Metaphosphate PO_4.

THE AUTHORS

HOBART SHIELDS

L. V. SORG

Hobart Shields, research chemist with Indiana Standard's research department at the Sugar Creek refinery, was graduated with the bachelor's degree from University of Kansas in 1923. Previous to his present connection he was employed by the Missouri, Kansas & Texas Railroad as a water-treating-plant supervisor.

L. V. Sorg, research group leader with the research department of Standard Oil Co. (Ind.), obtained his bachelor's degree from University of Kansas in 1927 and subsequently received the master's degree from University of Kansas City. In 1930, he became associated with the research department of Standard of Indiana at the Sugar Creek, Mo., refinery.

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alkalinity, every effort was made to maintain a bicarbonate alkalinity below this level.

Pilot-Plant Investigation

Associated with the purchase of the cooling tower for Sugar Creek was the procurement of a pilot-plant-size cooling tower to carry out experimental work as a guide to optimum operation of the large tower. The small cooling tower (Fig. 4) operates in much the same manner as the large tower. The basin of the pilot plant has a capacity of about 50 gal. From this basin the water is pumped to the adjacent scale-test laboratory where it can be circulated through any or all of three scale-test units operated singly or in series. From these units the water is returned to the top of the pilot plant and allowed to drip through the wooden latticework into the receiving basin. A fan produces the necessary cooling. The test exchangers associated with the pilot plant are of the same construction as those previously described, and are operated in the same manner.

The quantitative results obtained in the scale-test work must be appraised with understanding. In most cases duplicate tests were performed which yielded the same conclusion in each case, although the actual magnitude of scale formation or corrosive attack differed. Several factors were known to reduce the precision of the results:

1. Unavoidable temperature variations, which resulted from unsteady flow because of needle-valve plugging.

2. Manual control of chemicals addition.

3. Equipment failures, such as flow meters becoming inoperative.

4. Unavoidable loss of scale during removal of the test specimens.

In Table 3 are presented data on the various stabilizing agents examined. These are grouped according to the character of the principal chemical component in the mixture. Three types of agents were considered: (1) polyphosphates, which contained polymers above six phosphate groups per molecule; (2) a glucose derivative containing phosphate as well as chromium associated with the glucose molecule; and (3) metaphosphates — a commercial sodium hexametaphosphate (Compound E) and a trade blend thereof with higher polyphosphates and a synergist (Compound F).

As noted in Table 3, all of the above materials were tested against both admiralty and iron. The dosages found to be required in the test work were in all cases consistent with the vendor's recommendations.

None of the polyphosphates was acceptable as a stabilization agent. Scale formation was less than that observed in control experiments, but the appearance of the test specimens indicated possible difficulty in plant application due both to corrosion and to the deposition of a scale difficult to remove. Even the presence of chromate, which was admixed with the polyphosphate in Compounds A and C, did not completely inhibit corrosion of iron. Further, the use of chromate is objectionable in water with which workers may come in contact.

The combination of quachrome-glucosate and tetraphospho-glucosate did an exceptionally fine job of water stabilization against both admiralty and iron. However, the cost of the treatment, even after the initial dosage, was prohibitive.

Of all the stabilizers tried, only the commercial sodium hexametaphosphate and the trade blend thereof with higher phosphates were found to be worthy of full-scale trial. The synergist in the latter trade blend is alleged to promote protection in the presence of both ortho and metaphosphates. Tests with both materials indicated reduced corrosive attack. Although the test specimens showed appreciable amounts of scale, it was nonadherent and higher test-exchanger velocity probably would have removed much of it. The chemicals cost in the use of these compounds was reasonable, and a decision was made to conduct a 1-year plant trial with the trade blend of hexametaphosphate and higher phosphates.

Plant Trial of Compound F

The 1-year trial of the above blend in the plant was initiated in February 1950. The rapid change from the high pH process (8.1-8.5) to the low pH range of 5.8 to 6.2 was accomplished by the addition of sulfuric acid to the makeup water and directly to the cooling-tower basin. Higher-than-normal acid usage continued for several weeks as carbonate scale deposited in the process equipment was attacked. The pH of the water has been consistently controlled within the range of 5.5-6.5 by the use of a pH recorder and a solenoid-type acid-feed valve operated by an automatic timer.

To provide adequate stabilization of the water and the deposition of a phosphate film on the cooling surfaces, high concentrations of phosphate were initially maintained in the circulating water via additions of Compound F to the makeup water. The period required to establish phosphate equilibrium in the system was much longer than predicted. For 10 weeks it was necessary to maintain 60-70 p.p.m. of total phosphate in the circulating water. To accomplish this, the makeup water had to contain 20 p.p.m. of total phosphate. Since the initial period, it has been possible to maintain a total phosphate concentration of 30-35 p.p.m. by the addition of 16 p.p.m. of Compound F to the makeup water. Sulfuric acid consumption amounts to 0.5 lb. per 1,000 gal. A typical analysis of makeup and cooling-tower water is shown in Table 4.

To permit evaluation of the scale-removal characteristics of the low pH treatment before actual equipment observation was possible, information was obtained on the calcium, magnesium, and iron content of the cooling-tower effluent and the water returning from the process equipment. These analytical data, which are summarized in Table 5, do not indicate any impressive removal of scale-forming constituents.

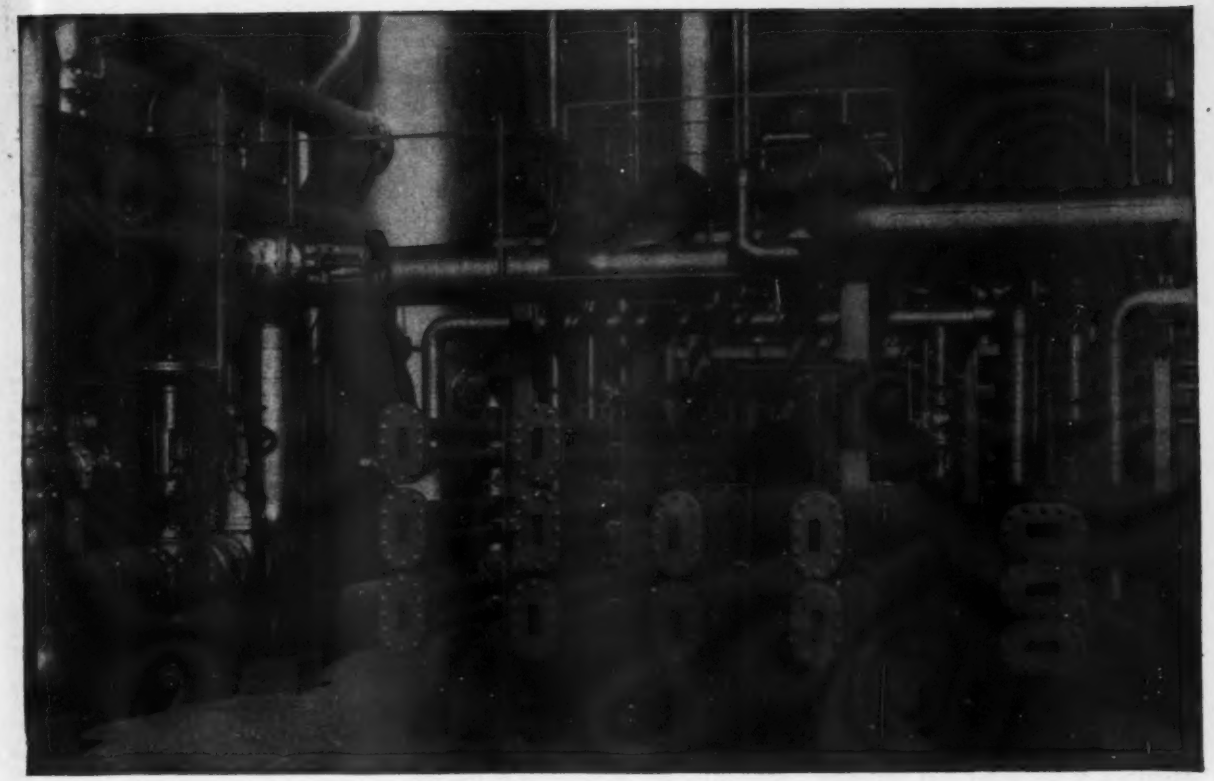
The applicability of the data for appraising scale removal appears to be justified, since throughout the entire period of observation the cycles of concentration and the quality of the makeup water were nearly constant. Thus, no undue addition or reduction in the calcium or magnesium content of the water occurred other than that associated with the use of water stabilizer. The marked in-

TABLE 4—CHARACTER OF WATER STABILIZED WITH COMPOUND F

	Makeup water	Cooling-tower effluent
Turbidity, p.p.m.	20	25
Total dissolved solids, p.p.m.	428	1,170
Hardness (as $CaCO_3$), p.p.m.	144	....
Alkalinity (as $CaCO_3$), p.p.m.:		
To phenolphthalein	0	0
To methyl orange	5	4
pH	5.7	6.1
Calcium (as $CaCO_3$), p.p.m.	88	340
Magnesium (as $CaCO_3$), p.p.m.	56	200
Sulfate (as Na_2SO_4), p.p.m.	260	1,022
Chloride (NaCl), p.p.m.	52	174
Cycles of concentration	...	4.0

TABLE 5—SCALE-FORMING CONSTITUENTS IN CIRCULATING WATER
(Parts per million)

Sampling date—	Tower effluent Ca	Tower effluent Mg	Tower effluent Fe	Return water Ca	Return water Mg	Return water Fe
Prior to low pH treatment:						
2- 1-50	409	263	0.32	383	265	0.45
2-17-50	438	284	0.23	430	270	0.36
After change to low pH treatment:						
3- 1-50	404	233	0.92	398	218	0.90
3-16-50	354	231	2.40	321	200	2.60
4- 1-50	290	197	2.60	284	185	2.20
4-15-50	381	163	2.60	312	210	2.40
5- 1-50	439	190	2.70	439	177	2.90



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crease in the iron content of the water may be the result of removal of corrosion products, such as iron oxides. If so, the high iron content indicates appreciable corrosion to have occurred with the former water-stabilization treatment.

After 3 months of operation in the low pH range, it was possible to examine process cooling equipment served by this water. There was evidences of some scale removal, but these were not as impressive as had been anticipated on the basis of claims for Compound F. For the most part, the scale had been softened but not removed; it was easily removed from the opened equipment by use of wire brushes and a stream of water.

Although a blue-colored complex film of iron compounds, calcium, and phosphate is reported to develop on surfaces completely protected by Compound F, examination of the metal surfaces revealed the presence of such a film only in isolated cases. It appears that some period of time in excess of 3 months is required to establish the evidences of complete protection.

Efforts to predict and evaluate corrosive attack and/or scale deposition have continued through the exposure of scale-test specimens, as previously described, to the water that circulates from the cooling tower. Two conditions have been revealed repeatedly by the study of these specimens. The corrosion of iron appears to be reduced by the low pH treatment. Scale deposition, however, appears to be likely, and alertness to indications of this in the plant equipment is desirable.

As the temperature of the cooling water in a condenser increases by virtue of duty on the condenser, the probability of scale formation increases. This conclusion is based upon evidence obtained by operation of the experimental test exchangers at 90°, 120°, and 150° F. At 90° F. only film-thin scale has been observed, whereas at the two higher temperatures the scale deposits appear to increase in thickness with temperature. Chemical analysis of the scale has shown it to be a calcium phosphate of low acid solubility. Hence, deposition of this scale would cause difficulty in the event that a tube-and-shell cooler would require cleaning.

The observations to date point out advantages in the use of the low pH metaphosphate stabilization of cooling-tower water, but also make it clear that this treatment is not without its dangers. Alertness to evidence of scale formation, by a scale-test technique and by a regular routine check of heat-transfer coefficients on process coolers, is requisite to the use of this treatment.

Acknowledgment

The assistance of P. J. Howard and C. T. Wesner of the Utilities Division at the Sugar Creek refinery is gratefully acknowledged.

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1. Langelier, W. F., Jour. A.W.W.A. 28, 1,500 (1936).
2. Ryznar, J. W., Jour, A.W.W.A. 36, 472 (1944).

BOOKS

THE CHEMICAL FORMULARY. By H. Bennett. Published by Chemical Publishing Co., 26 Court Street, Brooklyn. 599 pp. $7.

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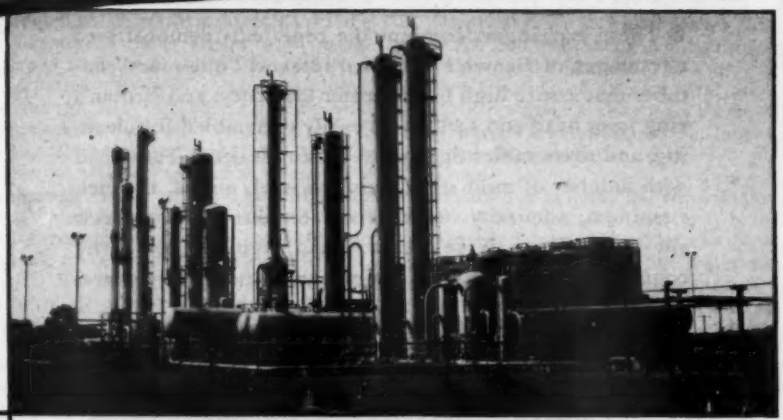

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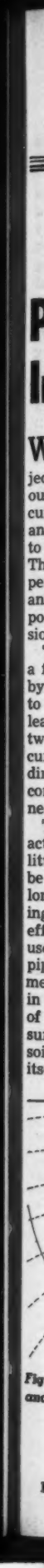

Pipe-to-Soil Potentials as an Indication of Corrosion

WHEN a buried pipe line, not under cathodic protection and not subjected to stray currents from extraneous sources, corrodes, electrical currents leave the pipe surface at anodic (corroding) areas and return to it at cathodic (protected) areas. The current density, in milliamperes per square inch, at the surface of an anodic area is almost exactly proportional to the rate at which corrosion is progressing at that point.

The current flow through the soil a few feet away from the pipe is not by any means directly proportional to the corrosion rate, but there is at least a rough correlation between the two, and certainly the presence of current in the soil near a pipe is direct evidence that there is active corrosion on the pipe somewhere nearby.

The technique of measuring the actual current leaving the pipe is a little too slow and cumbersome to be useful in a general survey of a long line. However, the current flowing in the soil near the pipe creates effects which may be detected and used as indicators of corrosion on the pipe surface. One of the most easily measured of these is the potential drop in the soil associated with the flow of the current to and from the pipe surface. It is convenient to refer all soil potentials to that of the pipe itself, since even quite large currents can only produce relatively small potential differences in the metal, because of its much lower resistivity than that of soil.

Fig. 1 shows the distribution of current and potential around a pipe at an anodic (corroding) section, and also around a cathodic section. The latter occupy a much larger percentage of the pipe length than the former, so the current density, and hence the potential drops are much lower. The small figures indicate the pipe-to-soil potential read at different points, using a copper/copper sulfate electrode to contact the soil.

Readings are usually taken at the surface of the ground, because this is more convenient, and serves the purpose almost as well. It will be seen that one characteristic which distinguishes the anodic section from the cathodic is the direction of the potential difference laterally; at the anode, the highest reading is directly over the pipe, with lower readings on either side; at the cathode, the reverse is true, but not so sharply. This demonstrates one method for the detection of the corroding areas.

Fig. 2 shows the potential distribution at the surface of the ground along the section of line lying between the two sections shown in Fig. 1. In addition to the lateral potential difference mentioned above, it will be seen that there is a distinct drop along the center line of the pipe; this is plotted in the form of a profile in Fig. 3. The distinction between an anodic area and a cathodic is immediately obvious from the figure.

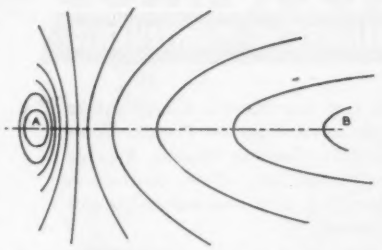

Fig. 2—Equipotential lines on the surface of the ground along a section of pipe line lying between an anodic (A) and a cathodic (B) section, as shown in Fig. 1.

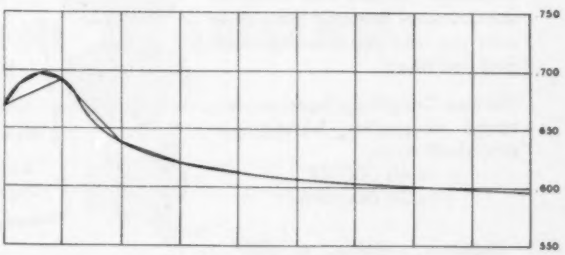

Fig. 3—Pipe-to-soil potential along center of pipe line shown in Figs. 1 and 2. Potentials in millivolts, referred to a copper/copper sulfate electrode placed at the surface directly above the pipe.

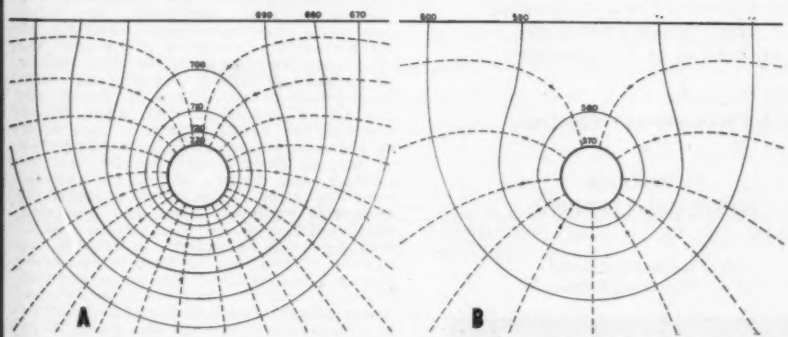

Fig. 1—Current and potential fields surrounding buried pipe line at (A) anodic, or corroding, and (B) cathodic, or protected sections. Current flow follows dotted lines; potentials shown in millivolts, referred to a copper/copper sulfate electrode.

An advantage of this type of survey is the rapidity with which it may be conducted, consisting as it does of a series of readings all taken at the surface of the ground directly above the pipe. Another advantage is that the presence of an anodic area is less likely to be obscured by extraneous currents flowing in the earth, either across the line or along it.

There is danger of passing up a danger spot completely, by skipping over it with too widely spaced read-

Part 4 of a series by Marshall E. Parker, consulting engineer, Houston.

XUM

ings. Generally speaking, on coated lines readings at 100-ft. intervals will be adequate, particularly if additional readings are taken at suspicious locations. The straight lines in Fig. 3 represent readings which might be obtained in such a survey with 100-ft. intervals. The anodic area, detected but not well outlined by the coarsely spaced readings, is well established by two additional observations.

It must be pointed out that, no matter how closely spaced the readings may be taken, some anodic spots will inevitably be missed. This will be particularly true of highly localized corroding cells, where the anodes and cathodes may be separated only by inches. No set of readings taken very far from the pipe could possibly locate such spots, and no survey involving readings taken at very small spacings could possibly be justified economically; the location of such small cells remains an unsolved problem.

The technique described is not applicable to bare lines, for too many of their trouble spots are of the small-dimension class. The entire approach to the location and treatment of corroding sections on bare lines is quite different, and must be treated elsewhere.

Illinois Water Floods

(Continued from page 48)

nois a nearly complete check on the general floodability of its many producing zones.

The Pennsylvanian sand floods are numerically in the lead because of their shallow depth and because they are closer to primary depletion than the more recently drilled producing formations. McClosky floods are next in numerical order primarily because their high permeability makes flooding on the primary well spacing feasible and because McClosky producing areas have generally been favored by abundant water supplies in the shallower formations. The remaining zones undergoing water flooding in Illinois have from one to three floods each. Of these zones, two have been outstandingly successful, the Tar Springs in South Maunie, and the Benoist in the Patoka field. The three floods in the high water content Aux Vases sand have not yet settled the question of the floodability of the Aux Vases sand, but the progress of these floods has improved the prospects for the eventual successful flooding of this horizon.

There does not appear to be any "best" formation for flooding in Illinois. All formations seem capable of possessing the necessary characteristics for successful flooding in one or more places within the state.

BOOKS

FUELS AND COMBUSTION HANDBOOK. Edited by Allen E. Johnson and George H. Auth. Published by McGraw-Hill Book Co., Inc., 330 West Forty-Second Street, New York. 915 pp. $12.50.

This comprehensive study of combustion and fuels comes closer to being a text than a handbook. The material has been gathered from hundreds of sources and edited so as to present to the reader an over-all picture of fuels, their characteristics, properties, and uses. Solid fuels are handled separately from liquid fuels in the various phases such as analysis, handling, storage, and firing, with emphasis being placed on the specific problems attendant with the use of each of the various types of fuel. In addition to the many solid fuels, petroleum and its derivatives, and natural and manufactured gas, supplementary sources of heat and power are given coverage. The fundamental reactions of combustion are presented along with the determinations of heat balances, smoke prevention, and draft requirements with accompanying calculations. A design approach for a fuel-burning plant covers the selection and purchase of fuel while subsequent chapters cover the fundamentals of furnace design, heat transfer and insulation, and boilers and steam generators. The rapid computation technique of alignment charts is used and wherever possible formulas are bypassed in preference for tables and graphs to simplify the solution of problems relating to the selection and use of fuels. Comparative tables showing the advantages, disadvantages, features, performance data, and applications of optional equipment are also given. Much of the material provided has been collected in the past 10 years—80 per cent—with half having been obtained in the last 5 years. This makes the handbook occasionally conflict with older references and opinions, but it is the editors' belief that their presentations are in current acceptance.

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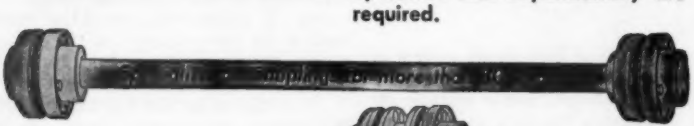

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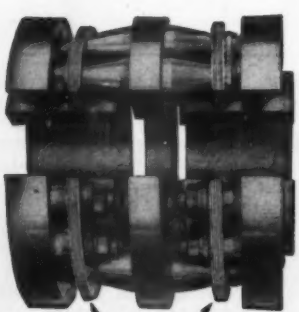

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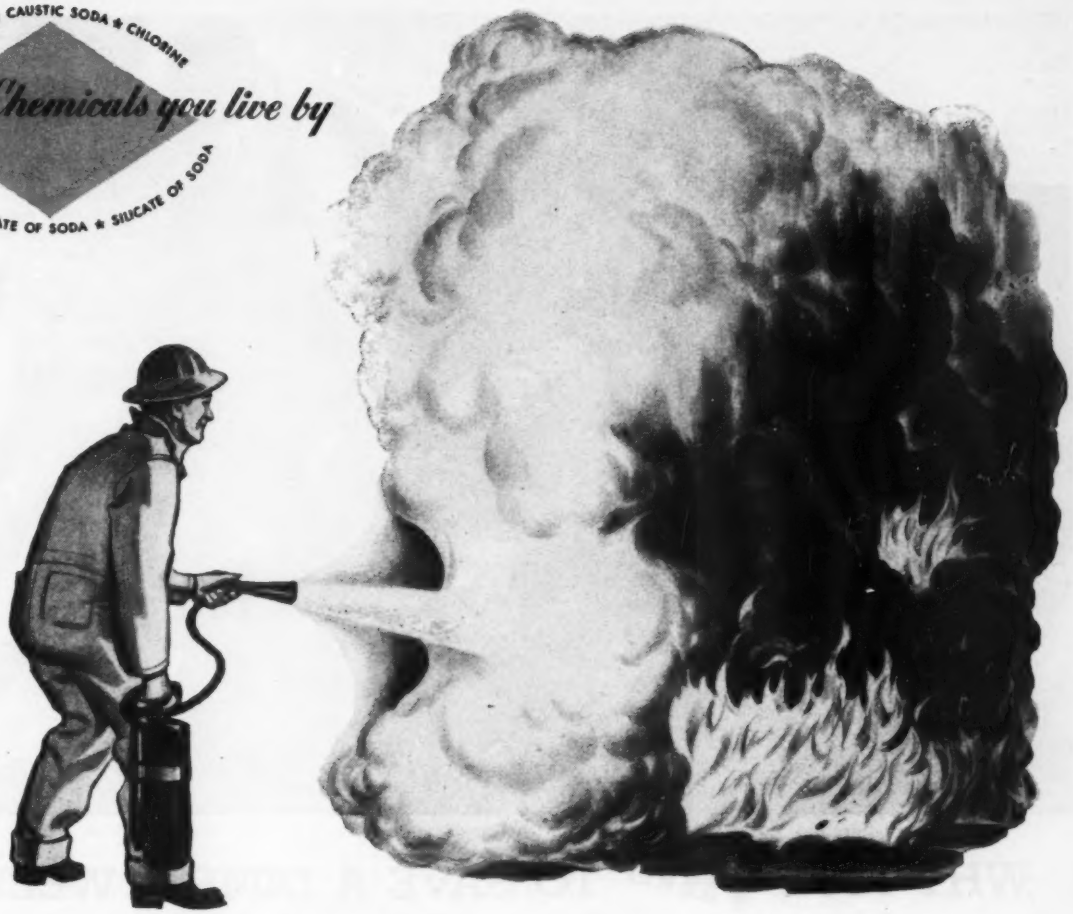

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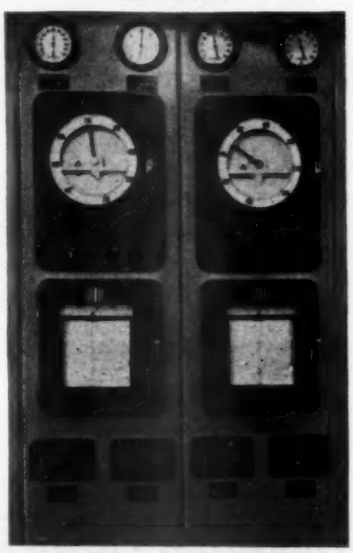

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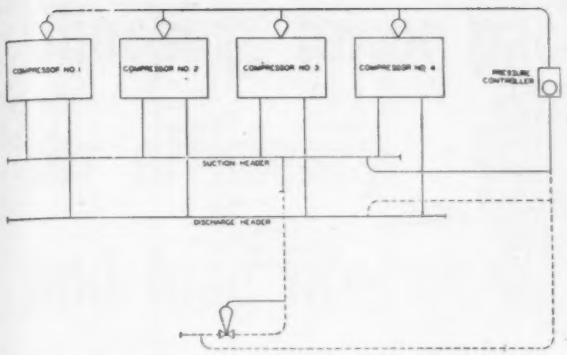

Fig. 1—Typical speed-control installation used in gas-compressor plants.

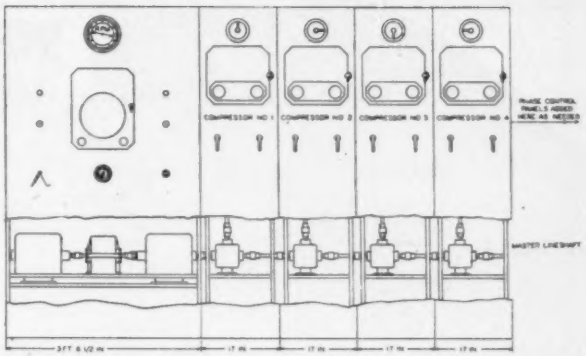

Fig. 3—Panel assembly for speed-control installation (phase control) when more than two engines are operating in parallel.

Speed Control and Synchronization

. . . of multiunit internal-combustion-engine plants

by Homer C. Givens*

WHENEVER two or more engines are run in parallel, synchronization is needed to get maximum efficiency from each unit. When some condition such as suction pressure, discharge pressure, or flow varies at irregular intervals at a compressor plant or pumping station, speed control is quite essential just as it is to control frequency in an electric generating plant.

*Plant superintendent, La Gloria Corp., Falfurrias, Tex.

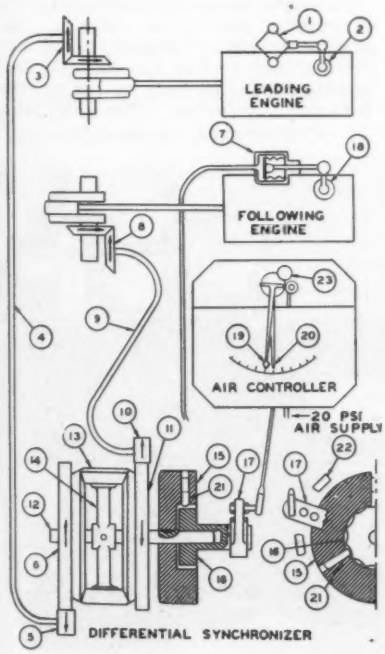

Fig. 2—Details of a speed-control system for two engines operating in parallel.

Fig. 1 shows a simple speed control system used extensively in gas compressor plants. Suppose that these compressors are operating in parallel in a casing-head-gasoline plant. Here a regulator is installed in the inlet line to obtain a constant suction pressure. The pressure upstream of this regulator is measured by a suitable control instrument which actuates diaphragm motor valves. The latter, equipped with valve positioners, set the engine governors for the required speed. This system may also be used to maintain a constant discharge pressure with varying demands of output. To do this, the pressure control instrument is connected to the discharge header instead of operating on the suction or field pressure.

Advantages, Disadvantages, Limitations

Like all speed-control systems, this one has advantages, disadvantages, and limitations. Some of the advantages are that it is simple, low in cost, and needs no special equipment. The maximum and minimum speed of the engines constitute the limitations. As to the disadvantages, the difficulty of keeping a number of diaphragm motors traveling exactly the same distance, with a common actuating pressure, is well known. This is especially true with valve positioners that are subjected to vibration, as when they are mounted on the engines. The second important disadvantage is the changes in the engines caused by uneven wear in the governors and push rods operating the fuel-injection valves. These two items probably cause most of the difficulties in speed control. The writer has observed differences as great as 20 r.p.m. in engines in two separate plants. This disadvantage is more pronounced when operating two-cycle engines than four-cycle ones, and the majority of gas compressors are now two-cycle, engine driven.

Some of the methods of individual engine-speed control in a multiunit station will now be reviewed. Probably the simplest method is to put a pneumatically set flow controller with automatic reset on the discharge from each compressor or pump. The output from the pressure-control instrument sets all the flow controllers, and they in turn control the individual engines to which they are connected. This system operates very satisfactorily if precautions are taken to eliminate pulsation in the flow on the discharge of the compressors or pumps. The greatest objection to this method is the high cost of equipment and installation.

Fig. 2 shows a system developed by Synchro-Master Co. of Seneca Falls, N. Y. This system also keeps the engines "phase controlled," that is, the engine crankshafts are kept in the same angular relation to each other at all times. The advantage of this is to reduce pulsation when several compressor or pump cylinders are operating in parallel.

In Fig. 2 we see two single-cylinder engines, one of which is the reference or leading engine and the other the following engine. As can readily be seen, they are operating 180° apart as regards crankshaft angularity.

In this case governor (1) of the leading engine may be set by hand or some automatic device for the desired speed. Through bevel gears (3) and a flexible shaft (4), gears (5) and (6) are driven on the leading side of a

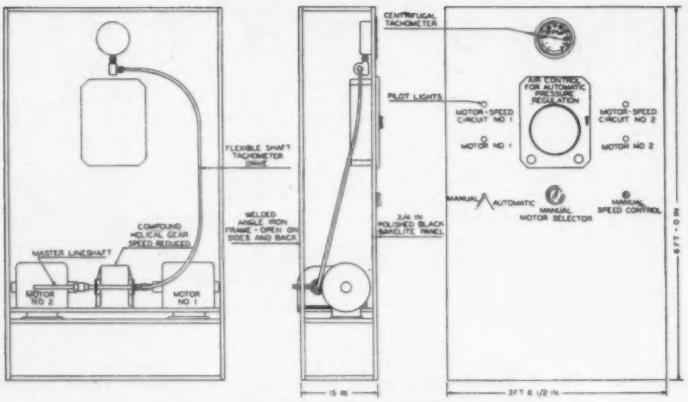

Fig. 4—Master speed-control assembly.

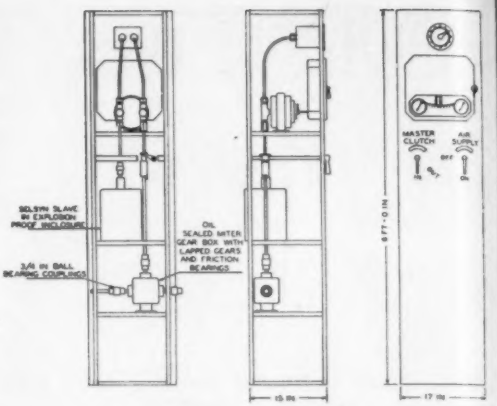

Fig. 5—Phase control panel assembly.

differential unit. Gears (8), on the following engine, drive gears (10) and (11) on the other side of the differential unit. When both engines are running at the same speed, gears (6) and (11) rotate at the same speed but in opposite directions, and gears (13) rotate on spindle (14) which does not change position. However, if one engine changes speed the corresponding gear in the differential unit changes speed, spindle (14) will then begin rotating about its axis and turn shaft (12) which through clutch (15) operates the pneumatic controller. The controller in turn resets the governor or throttle of the following engine bringing it into synchronization with the leading engine. If the controller is equipped with automatic reset, the phase or shaft angularity will be maintained.

When more than two engines are operating in parallel, it is not good practice to use one as a reference. In this case, this same company uses a system as shown in Figs. 3, 4, 5, and 6. Here a synchronous motor driving a master line shaft through a variable speed reducer gives the reference speed. The speed reducer may be changed manually or automatically from a controller. The leading side of the differential for each engine is driven from the line shaft and the following side by a flexible shaft or Selsyn slave from the engine.

Types of Transmitters

A pneumatic speed transmitter which has a rotating circular magnet in a metal cup is manufactured by Foxboro Co. The cup is supported by cross flexures which determine the amount the cup can rotate. The rotation of this cup actuates a force balance pneumatic transmitter. A 3 to 15-psi. receiver-controller receives the output of the transmitter and records and controls the speed of the engine. The controller in this system may be pneumatically set by a master controller and thus all engines of a station may be synchronized.

Another manufacturer, Taylor Instrument Cos., also has a pneumatic speed transmitter that uses a small flyball governor mechanism to operate the force balance 3 to 15-psi. transmitter. The remainder of the Taylor system is similar to the Foxboro system. Brown, Bristol, Leeds & Northup, Weston, and several other companies build a system of speed control from their standard electrical tachometer units and pneumatic controllers.

While the author has not had actual operating experience with these individual engine-control systems, contacts made with operators of a Synchro-Master, a Foxboro, and a Taylor system, have indicated favorable operating service for long periods of time with very little maintenance. The cost of all these systems is high, but not exceedingly so, when a large compressor plant or pumping station is being constructed. However, the expense may become a major factor in discussion with management upon installing one of these systems in an existing plant. At the present time the cost of these systems is between $600 and $1,000 per engine.

A control system worked out by the instrument men of the author's company is currently being installed. Referring back to Fig. 1, a variable frequency oscillator will be set by the pressure controller. The oscillator

(Continued on page 76)

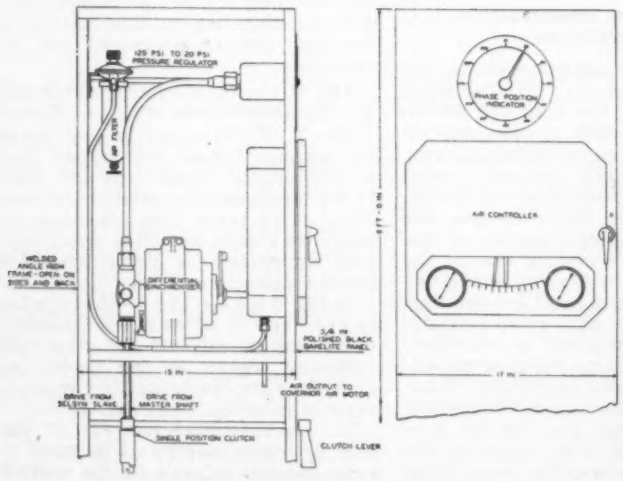
120 PSI TO 20 PSI PRESSURE REGULATOR
AIR FILTER
PHASE POSITION INDICATOR
AIR CONTROLLER
WELDED ANGLE IRON FRAME - OPEN ON SIDES AND BACK
3/4 IN. POLISHED BLACK BAKELITE PANEL
5'7" - 0 IN.
15 IN.
17 IN.
DRIVE FROM SELSYN SLAVE
DRIVE FROM MASTER SHAFT
AIR OUTPUT TO GOVERNOR AIR MOTOR
SHEAVE POSITION CLUTCH
CLUTCH LEVER

Fig. 6—Assembly detail of phase control.

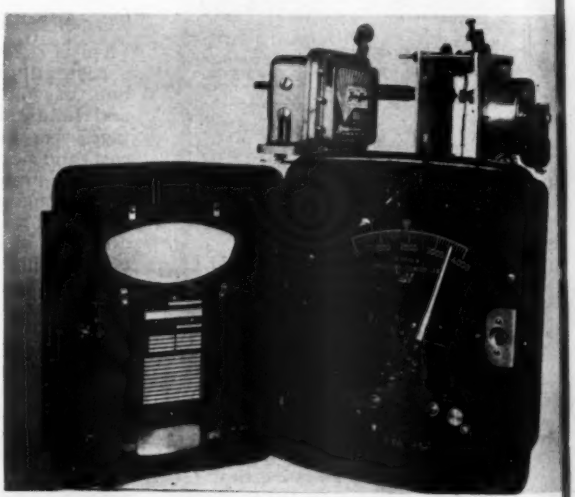

Fig. 7—Photo shows differential mechanism (at right) and speed reducer (left) mounted behind pressure controller.

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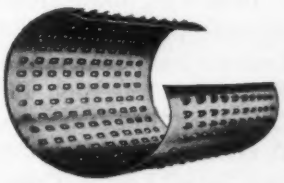

Diagram of protruded packing made by Scientific Development Company, State College, Pa. The individual pieces are small, yet have a large free cross-section. Made in Nickel, Type 316 Stainless Steel, and other metals (on special order).

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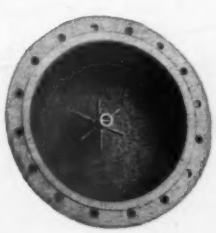

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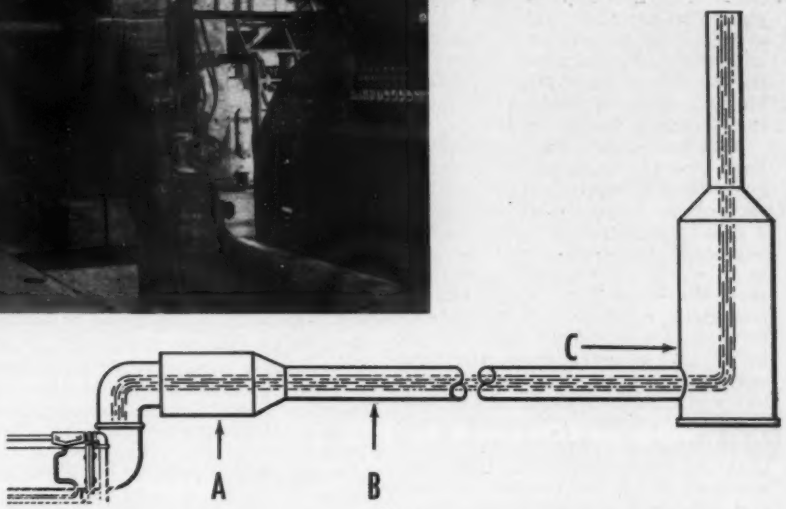
Fig. 1—(Right) Diagram of the dual system of muffling, a recent development.

Fig. 2—(Above) Muffler system in the Gila Bend station, El Paso Natural Gas Co.'s Texas-California line.



by

Michael P. Siroff

Mufflers—Their Function and Design

—in stationary internal-combustion engines

THE muffling of exhaust gases from stationary internal-combustion engines has progressed a long way since the early days when a part of the job of a foreman installing the engine was to fabricate a muffler for it. He would use the material on hand and would apply all his best knowledge and ideas.

Seldom do we see nowadays the concrete pits filled with rocks or cinders that would create a devious path for exhaust gas flow, and thereby would silence the noise at an expense of a back pressure, or the restriction-type muffler which was also so extensively used in the automotive field. Here the exhaust gases would be made to pass through a series of baffles or perforated chambers. The trouble encountered with this type of muffler was that in order to be effective at a low back pressure its size would have to be made unduly large.

The introduction of the multicylinder, high-speed, two-cycle engine with its inherent sensitivity to excessive exhaust-line lengths, greater exhaust volume per unit horsepower due to scavenging, and the peculiarities of its exhaust sound has created new problems for the muffler designer. Mufflers which were performing satisfactorily on four-cycle engines were found to be inadequate for those of two-cycle type. These were probably some of the reasons why we find that during the last decade more time and effort have been put in muffler research than at any other time before.

Muffler Design

If we analyze the construction of present mufflers for the stationary internal-combustion engine, we will find that as far as the problem of sound attenuation is being concerned, almost all of them are designed on the basic principles of acoustics.

Any muffler, in addition to being a good silencing device, must be designed to:

1. Eliminate pulsative waves set up in the exhaust gases by the reciprocating motions of the power pistons.

2. Meet the minimum pressure drop requirement as set by the engine manufacturer.

3. Discharge the exhaust gases to an elevation where they will not be harmful to surroundings or to persons.

4. Combine all the desirable performance characteristics with those of design uniformity, parts interchangeability, and the production economy.

Pulsations in exhaust gas stream.—Poorly designed and improperly located mufflers have an adverse effect on the engine performance due to the presence of pulsations in exhaust-gas stream. The exhaust pipe extending from the engine exhaust manifold to its connection with mufflers has a definite resonant frequency, depending on its length and the temperature of the exhaust gas. If the fundamental resonant frequency of this pipe is equal to that of the fundamental frequency of the engine, the trouble will result with almost certainty. To eliminate the possibility of this occurrence, certain empirical formulas have been developed by use of which one can calculate the safest length of the exhaust pipe for each engine. The best solution in such cases would be to design a muffler that would eliminate the gas-stream pulsations as well as silence exhaust noise. Application of such muffler would be especially desirable for two-cycle engines of crankcase scavenging type which are quite sensitive to pulsations and high back pressures.

One of the developments in the design of modern mufflers that came out during the last 2 years is one of the dual system of muffling. (Fig. 1). The system consists of three component parts: (1) high frequency attenuating chamber (A), (2) properly sized exhaust pipe (B), and (3) a low frequency attenuating chamber (C), usually located outside of the engine room. This system can be de-

signed to perform a double function, that of pulsation dampening and of sound attenuation.

When properly designed, the system will eliminate the danger of reflections and conditions of resonance in the exhaust pipe thereby permitting the installation of the second chamber at any distance from the engine. The physical dimensions of the system's component parts will vary with the cutoff frequency desired and the maximum back pressure allowable. One of the typical installations of this system is shown in Fig. 2.

Back pressure. — The magnitude of back pressure created by a muffler has a definite bearing on the performance of the engine; however, there is a great difference of opinion among engineers and engine manufacturers as to what is the proper back pressure. We know that in the automotive field, mufflers can be designed for a much higher back pressure than in the stationary engines, the average being about 6 in. of mercury for the quiet zone. We also know that two-cycle stationary engines, especially those of crankcase scavenging type are very sensitive to high back pressure which represents lost work and decreased efficiency, and, therefore, we find that the average design pressure drop for mufflers on stationary internal combustion engines lies between 4 and 10 in. of water.

It should be pointed out that mercury or water monometers do not always give a complete and true picture of the back pressure. The presence of pulsations in the exhaust gas flow makes it extremely difficult to find the real magnitude of the back pressure. This may be further complicated if reflections and stationary waves are present. Probably the best way to obtain reliable data is to use one of the specially developed instruments known as electrical differential pressure indicators.

"Standard" mufflers. — Since it is economically undesirable for a manufacturer to design a muffler for every stationary internal-combustion engine on the market or in the field, he usually resorts to the establishing of a line of "standard" mufflers. Each unit of this line is then designed to cover a certain range of engines depending on their horsepower ratings, type of fuel, number of strokes, speeds, etc. The number of units in a line may be anywhere from 16 to more than 20.

In the dual system of mufflers described previously, fitting of an engine with a proper muffling system is made easier than with the ordinary muffler. Since the dual system consists of three component parts (two chambers and the exhaust pipe), the designer has a number of combinations or standard parts from which he can select a most effective arrangement for a given engine.

Some muffler manufacturers offer more than one of standard lines of mufflers. Usually one of these is designed to do a better silencing job than the others, and is offered for such installations as hospitals, hotels, and residential districts where quiet is to be maintained. Other manufacturers treat such installation as special cases and usually design a muffler or a muffling system to meet the requirements.

THE AUTHOR

Michael P. Siroff, after receiving his B.S. degree in petroleum engineering from University of Southern California in 1932, spent 6 years in the oil-refining industry in China. The Sino-Japanese War forced him to leave that country and his next job was to completely rebuild and modernize an oil refinery in Chile, South America. In 1941, after a 3-year sojourn in South America, he joined Fluor Corp. where his main work was in the development and design of mufflers, gas cleaners, pulsation dampening systems. Until his death in December, he was design engineer of metal products in the manufacturing division of Fluor Corp., Ltd.

Types of Mufflers

All mufflers, whether of single-unit type or of a dual-system type, used on stationary internal-combustion engines may be divided into two general classes: air-cooled and nonair cooled. In order to better fit into engine house layout, each of these mufflers may have an exhaust inlet located either at the bottom or on the side. Thus we have the bottom-inlet type and the side-inlet type. The latter type may have exhaust inlet flanges located at the top of the shell or near the base plate.

The air-cooled mufflers shown in Figs. 3 and 4 are used extensively in petroleum and natural-gas industries as well as in marine-engine installations. Their main features are:

1. They provide a positive induced draft ventilation of engine room.
2. They reduce the temperature of muffler shell and exhaust pipe, thereby greatly prolonging their lives.
3. They eliminate the necessity of

Fig. 3—Air-cooled bottom-inlet dual-type muffler.

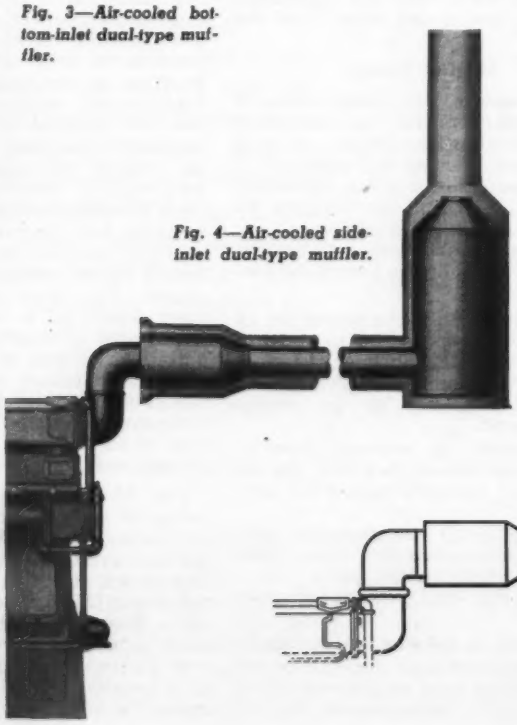


Fig. 4—Air-cooled side-inlet dual-type muffler.

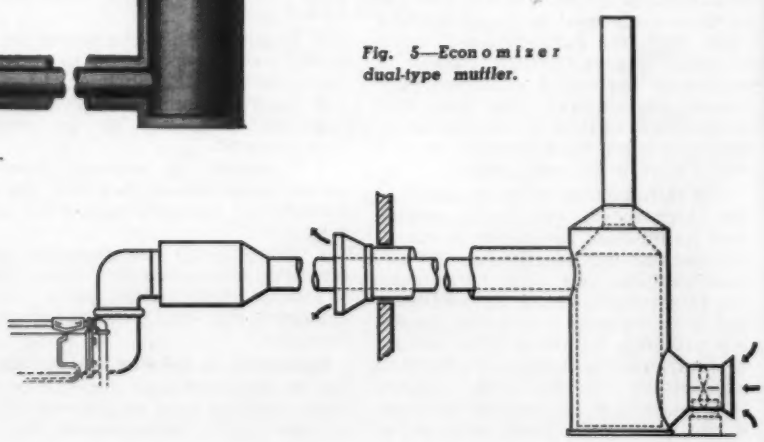


Fig. 5—Economizer dual-type muffler.

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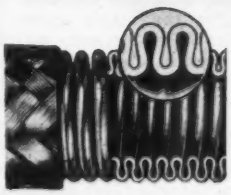

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lagging and inherent possibility of burnouts under it.

4. They reduce the final exhaust temperature.

The quantity of air educted by an air-cooled muffler depends on many factors, such as the air resistance of the ventilating system, nozzle and throat design of mufflers, engine load, engine speed, etc. Actual performance tests in marine installations with large-diameter air ducts have recorded air draws in ratios by weight of six parts of air to one part of exhaust gas. In ordinary compressor-house installations there is usually no need for such high degree of ventilation and air-cooled mufflers are designed for draws of one to three parts of air to one part of exhaust. Number of air changes effected by air-cooled mufflers varies from 10 to 15 per hour, depending on design of ventilating system.

The nonair-cooled mufflers are designed for the same sound muffling efficiency as the air-cooled ones, and their application is reserved for those installations where engine-room ventilation is not an important consideration. These mufflers are mostly of bottom-inlet type and are especially adapted for vertical installations.

There are various special types of mufflers that are being used on stationary internal-combustion engines. Some of these are: spark-arrestor mufflers; heat-economizer mufflers; waste-heat boiler mufflers with or without spark-arresting features.

In fire-hazardous areas, such as oil refineries, or where dirt nuisance are not tolerated, spark-arrestor mufflers are being used. The spark-arresting element is usually a single cyclone unit around which a muffler proper is built. Properly designed cyclone units usually have efficiency of 95 per cent or higher without sacrificing the silencing property of a muffler.

Heat-economizing mufflers are just a variation of an air-cooled muffler mentioned previously and are used for heating engine houses during cold months. Fig. 5 illustrates one type whereby outside air is circulated around the hot muffler shell and exhaust pipe by means of a blower, and then is discharged into the engine room. Hot-air bypass and damper device are usually required to control the temperature of hot air entering the room.

Waste-heat boiler mufflers are designed to utilize the exhaust heat for generation of steam or hot water. Heat-transfer rates are greatly improved by high mass velocities and extension of heating surface. Installed on four-cycle diesel engine for generation of 30.0-psig. steam, approximately 0.75 lb. of steam per brake horsepower was developed, according to reports.

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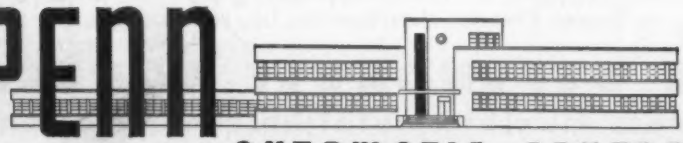


AUTOMATIC CONTROLS

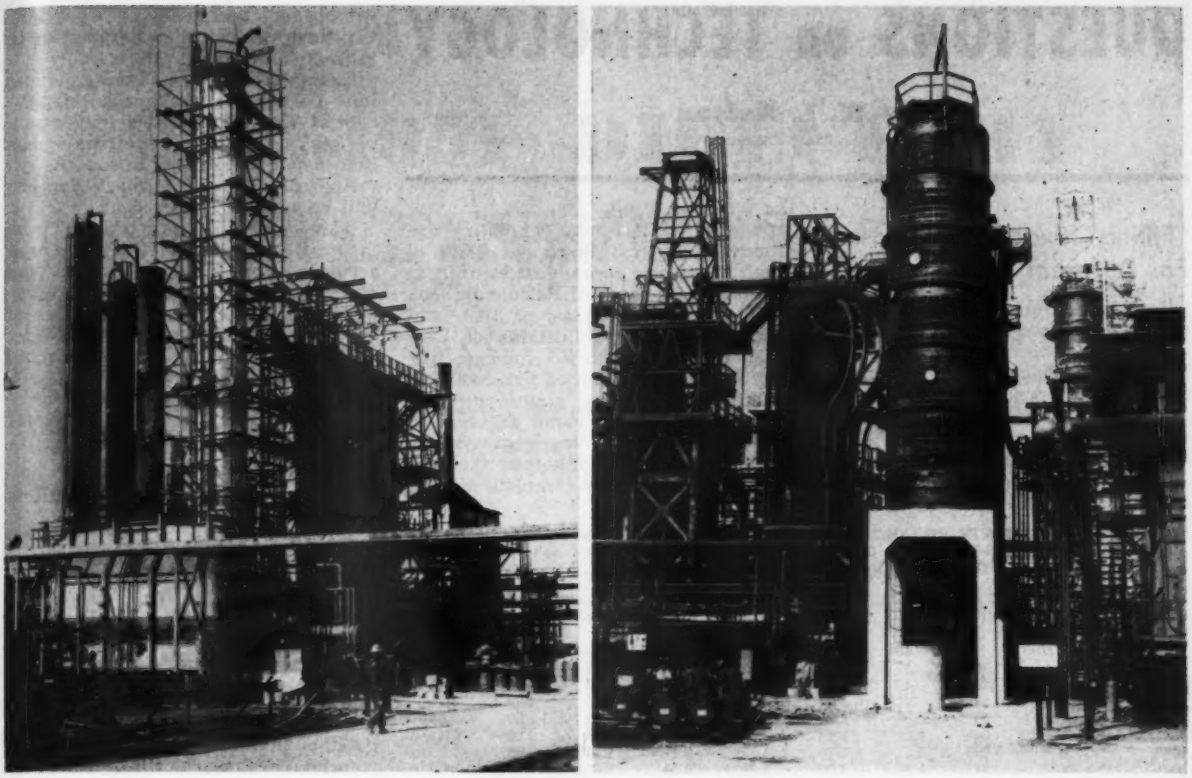
FOR HEATING, REFRIGERATION, AIR CONDITIONING, PUMPS, AIR COMPRESSORS, ENGINES, GAS RANGES

Speed Control and Synchronization

(Continued from page 70)

will drive a clock motor (terminal shaft speed 1 to 5 r.p.m. at 60 cycles) connected to a differential mechanism which may be seen at the top (right) behind the pressure controller in Fig. 7. The speed reducer connected to the other side of the differential will be driven by the engine under control. The spider of the differential connected to a controller will change the engine speed as the variable oscillator changes the clock speed. It is believed that this system, including master pressure controller, oscillator, diaphragm motor with valve positioner, and differential unit with controller could be installed on a six-engine station for $300 per engine.

The system worked out by the instrument men of the author's company for speed control may be modified slightly and used as a frequency controller. Instead of the variable oscillator a tuning-fork-controlled oscillator of desired frequency is used and it will drive one motor of the differential unit. (Fig. 7). Another motor will be connected to the light circuit and substituted for the speed reducer on the differential unit. The movement of the spider will control the speed of the engines either electrically or pneumatically, thus effecting frequency control.



Left: This low-pressure U.O.P. catalytic polymerization unit is being converted to high-pressure operation. Right: A new vacuum unit which is to be operated to produce feed stock for fluid catalytic cracking unit.

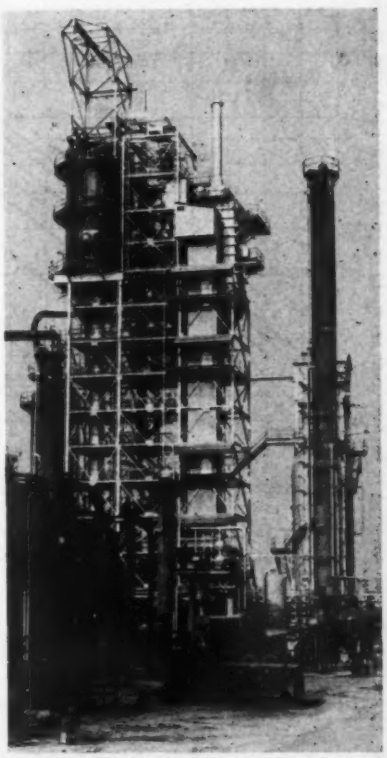
Wilshire Enlarging, Modifying Refinery at Norwalk, Calif.

Modernization program involves expenditure of a million and a quarter dollars

WILSHIRE OIL CO.'S expansion and modification program for its refinery at Norwalk, Calif., involves an expenditure of $1,250,000. The changes in the refinery's flow arrangement are to be made on a basis of 22,500 bbl. daily input of various crude oils. The plant's originally two-coil Dubbs thermal cracking plant will be changed to a single-coil unit. Vacuum distillation of reduced crude will be accomplished with the light-oil heater which is to be included in the vacuum unit.

Reduced crude charged to the vacuum unit will produce heavy gas oil and pitch. Pitch from the vacuum unit enters the cracking plant along with the recycle from the fluid catalytic cracking unit. Virgin gas oil and heavy material produced in the vacuum unit, combined will supply the charge to the catalytic cracking plant. Vapors uncondensed in all units will be concentrated for absorption and fraction to supply a liquid feed for a new high-pressure U.O.P. polymerization unit. An original five-case unit will be converted into a feed-preparation unit for the high-pressure poly plant.

Fuel gas will be processed through a new and revamped H_2S extraction plant to provide clean fuel for the refinery to eliminate SO_2 in the refinery stacks. Fred B. Behrens, refinery manager, has plans for immediate construction of a waste-water system to suitably clarify waste for release into the sewage systems.



The fluid cat cracker at Norwalk is being reconditioned and modernized.

QUESTIONS on TECHNOLOGY

by W. L. Nelson
Consulting Engineer

"Filling" Evaporation Losses For Different Liquids—No. 2

Last week's question concerned the evaporation losses that will be encountered in storing benzol. Standing losses were discussed as a function of the losses encountered in storing 10-lb. R.v.p. gasoline. The answer is continued here—discussing filling losses.

Filling losses for gasoline in the range of 0.3 per cent per filling are indicated by Boardman and Clark in their "Pressure Storage of Petroleum Products" (Science of Petroleum, Vol. 1, Oxford Univ. Press, p. 818), and illustrations in publications of Chicago Bridge & Iron Co. indicate filling losses of 0.1 and 0.2 per cent.

Filling losses are almost directly proportional to the vapor pressure of the liquid, because the heavy vapor tends to lie as a blanket on the surface of the liquid. If complete mixing of air with the vapors should occur, the relationship would be the same as that shown last week on this page for "standing losses," but such a situation is unusual. Table 1 herein shows the relative filling losses as a fraction of the losses encountered in filling a tank with 10-lb. R.v.p. gasoline at a temperature of 60° F. Fig. 1 shows the same information except that it was assumed that the filling loss for 10-lb. R.v.p. gasoline at 60° F. is 0.2 per cent per filling. Thus, Fig. 1 is only approximate and should be used only to grasp the general effect of temperature and type of material. It applies primarily to small tanks (5,000 bbl.).

Table 1 is the basic relationship. If the filling losses for a tank can be established, the losses at other temperatures or for other liquids can be estimated by means of ratios.

Example.—Benzene is being pumped into a 4,000-bbl. tank at a temperature of 80° F. It has a vapor pressure of 3.4 psia. which corresponds to a Reid vapor pressure of about 3.0.

According to Fig. 1, the filling loss will be about 0.09 per cent.

If any data on evaporation from the tank are available, Table 1 is most accurate. For example, if the tank had been used for aviation gasoline (7-lb. R.v.p.) and the filling loss at 110° F. had been found to be 0.25 per cent, the filling loss for benzene can be computed as follows:

From Table 1, see 2.02 for the aviation gasoline at 110° F. and 0.44 for 3-lb. R.v.p. benzol:

$$0.25 \times \frac{0.44}{2.02} = 0.055 \text{ per cent per filling}$$

TABLE 1—APPROXIMATE FILLING LOSSES RELATIVE TO (OR AS A FRACTION OF) THE LOSS OF 10-LB. R.V.P. GASOLINE BEING HANDLED AT 60° F. PER CENT PER FILLING. PRIMARILY FOR SMALL (5,000-BBL.) TANKS

	Relative filling losses—per cent per filling							
°F.	3 R.v.p.	5	7	8	9	10	11	12 R.v.p.
20	..	.19	.29	.34	.38	.43	.48	.53
40	.17	.31	.45	.53	.60	.67	.74	.81
60	.28	.48	.69	.79	.91	1.0	1.11	1.21
80	.44	.72	1.01	1.15	1.31	1.46	1.62	1.75
90	.54	.87	1.21	1.38	1.58	1.73	1.92	2.08
100	.64	1.04	1.44	1.63	1.85	2.06	2.25*	2.44*
110	.79	1.21	1.70	1.92	2.17	2.42*	2.66*	...
120	.94	1.44	2.02	2.28*	2.54*	2.82*	...	...

*Probably too high because of self-refrigeration of the liquid by evaporation.

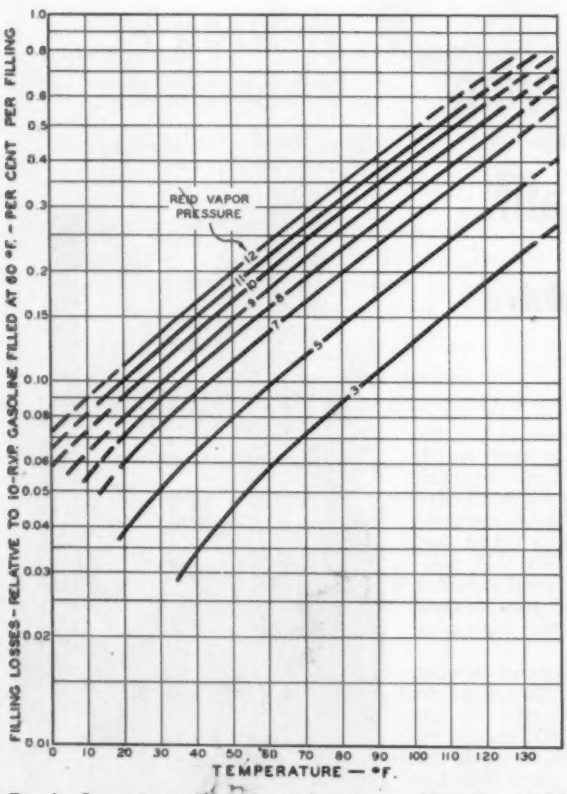


Fig. 1—Approximate filling losses based on a filling loss of 0.2 per cent for 10-lb. R.v.p. gasoline being handled at 60° F. Per cent loss per filling.

Refineries Not Package Units

We are interested in securing some information concerning "cracking plants" and small refinery units. Any information you can suggest will be appreciated.—A. E. W.

Although some refinery units bear proprietary names derived from patents, construction companies, etc., particularly "cracking plants," all major refinery units are "tailor made" for the particular oils that they will process or the particular market that they must serve. Thus, advice must be sought from construction contractors or consultants or advisors, because descriptions of refinery processing always tend to be detailed or lean toward design computations. Chapter 7, "Introduction to Processing," Chapter 9, "Refinery and Distillation Processes," and Chapter 20, "Thermal Cracking and Decomposition Processes," in Petroleum Refinery Engineering (McGraw-Hill Book Co., Inc., third edition, 1949) discuss processing but they are quite complicated.

If costs are of interest, Table 1 indicates the approximate 1951 costs of topping, cracking, and combination units. Complete refineries cost far more, occasionally only three times as much as the major process equipment but often six times as much. The only "package unit" equipment are certain individual items such as pipe stills, gas-absorption plants, boilers, or compressors.

TABLE 1—APPROXIMATE COSTS OF REFINERY UNITS
(Not complete refineries)

Capacity (bbl. per day)	Topping (on crude)	Thermal cracking (on feed)	Topping and cracking (on crude)
1,000	$118,000	.....	.....
2,000	173,000	$705,000	.....
3,000	222,000	900,000	$820,000
5,000	300,000	1,200,000	1,050,000
7,000	360,000	1,500,000	1,300,000
10,000	450,000	1,950,000	1,650,000
15,000	555,000	.....	2,100,000

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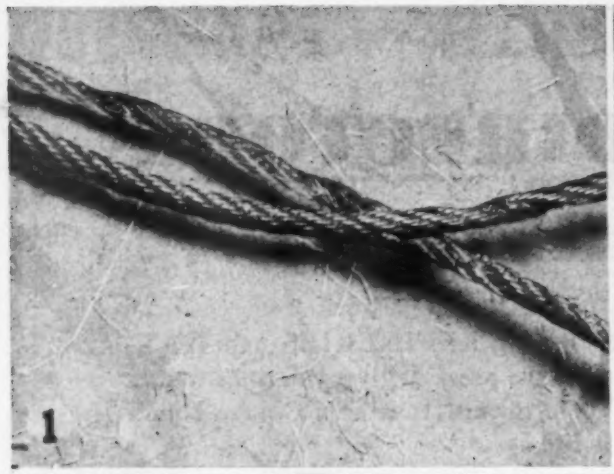

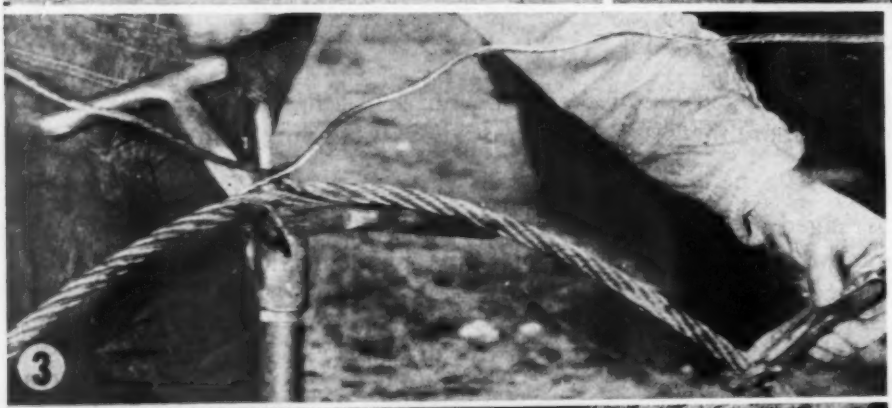

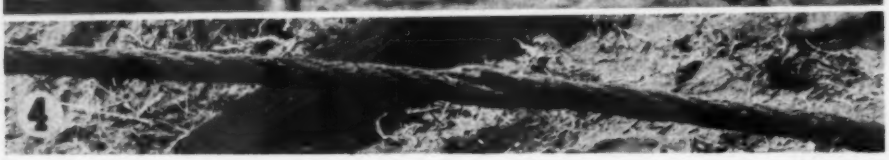

1. BEGINNING OF A SPLICE. Two strands of one part of the line have been raveled back, and are replaced with two strands of the other part.
2. THE NEXT STEP.—One of the pair of strands has been singled out, and is being laid in the place of another, just ahead of a tuck-in.
3. BEGINNING OF TUCK.—Here a tuck is being made with the use of a pair of wire-line needles. The two loose ends shown will be placed in the center of the line, replacing the core of the line.
4. THE FINISHED TUCK.—Although this looks rather bulky and loose, as soon as it is run over a sheave and weight put on the splice, its diameter will decrease to nearly that of the original line.

Wire-Line Repair and Uses *in the oil industry*

Here are some kinks on taking out the kinks—and on getting better service from your lines

by Roy F. Carlson
West Texas District Editor

SHORTAGES hit the oil industry in many ways, particularly in steel products, and although most important of these is tubular goods, wire line also is very important, and is in short supply. Conservation of the existing wire goods is being given more and more attention, whether the line be for swabbing, cable-tool drilling, or conductor cable for the various kinds of well-surveying units.

Often in the past when these various kinds of line became extremely worn, kinked, bent sharply, or were shorter than necessary, the line was discarded for a new one. Current shortages, however, are giving rise to consideration of methods of repair of breaks or bad sections, or of joining parts of old lines.

When cable tools were in their heyday every driller was adept at splicing his drilling line if it parted but now the art of splicing has begun to disappear. But this disappearance is not complete as evidenced by the accompanying pictures.

The pictures show parts of the operation of putting in a long splice, by E. W. Harrison of Odessa, Tex., who has started a new service for wire-line splicing. The splice is being put into a swabbing line that was shortened through use and needed lengthening.

Most splicing of this nature, done on swabbing lines particularly, is what is called the "long tuck-in splice." This splice is about 30 ft. long in most lines used for swabbing service. It is made by using about 15 ft. of each of the joined ends. The splice is made by unraveling a strand from one of the pieces of line, and replacing it with a strand from the other line, with the ends of the two strands being tucked into the line itself in place of the core. The various strand pairs are tucked into the line at several places along the length of the splice, so that at each of these places there are seven strands of wire in the line, the core being replaced with a strand. Also, there are no tag ends sticking out from the line. This long splice is essentially the same diameter as the new line, and is smooth on its exterior so that it will pass through such fittings as wipers

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The man's right, of course. Anyone who has ever used a Guiberson swab will tell you that it's a top-notch performer that drops exceptionally fast and comes back up with a full load every time there's a full load to pick up. It's fast dressing—takes the interchangeable "L," "J" and "K" cups in pairs or in any combination.

With the versatile "K" swab and these three Guiberson cups, you can effectively and economically swab ANY well—lift the most fluid in the least number of trips.

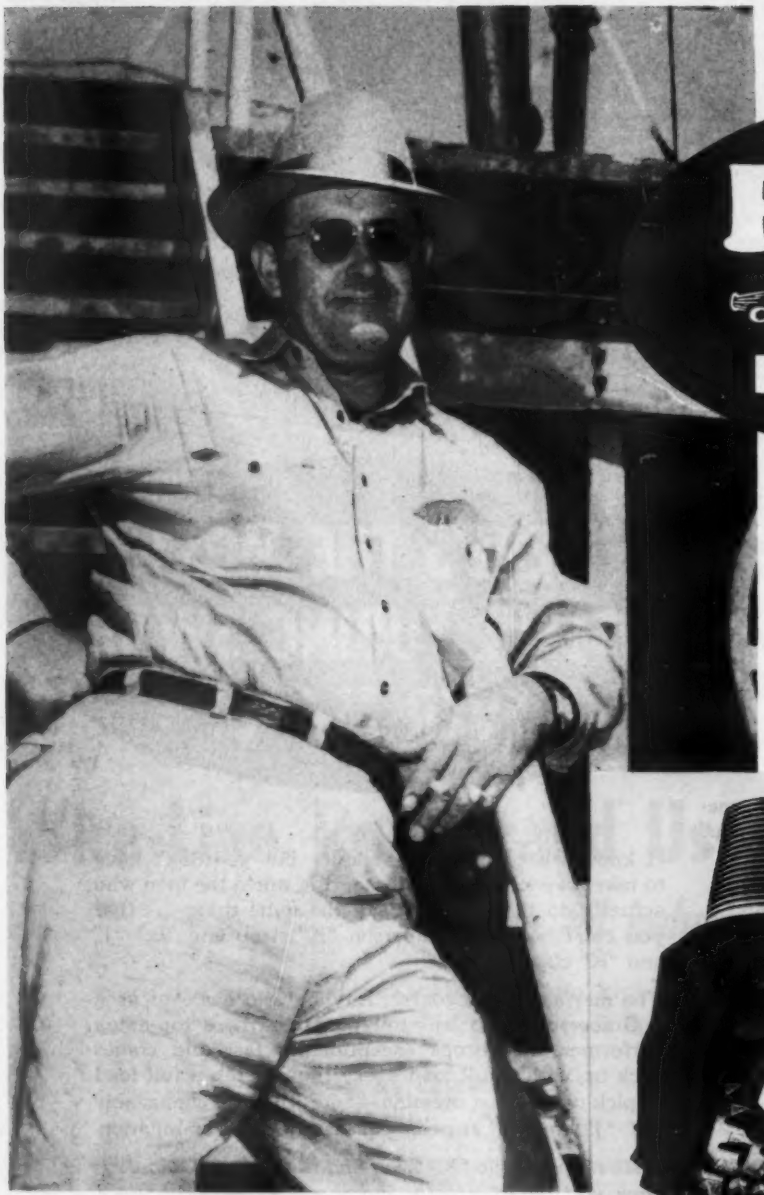
SOLD BY LEADING OIL FIELD SUPPLY STORES EVERYWHERE

GUIBERSON

FOUNDATION

"I get good long runs with REED *Rock Bits"*

...says M. R. (Buck) Parish, tool pusher for Loffland Bros. Co.



REED
Liquid-blast
ROCK BITS

"**REED** Rock Bits help me keep drilling costs down. I like to use them because I can depend on them for fast penetration and good long runs."

For good long runs, use the REED "LB"

REED ROLLER BIT COMPANY

HOUSTON 1, TEXAS

NEW YORK LONDON BUENOS AIRES

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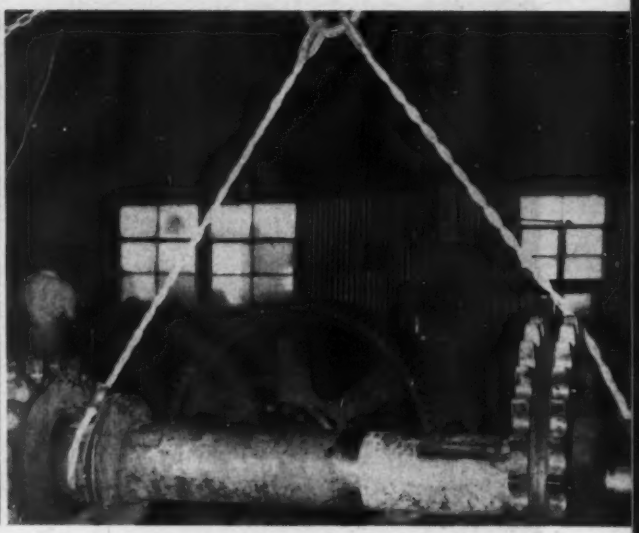


Three of the various types of braided slings used in oil field shops are shown. The flexibility and strength of the slings make them highly desirable for many load-lifting jobs.

or oil savers on the surface of the well in a swabbing operation.

Modifications of the above splice are necessary when the pieces of line that are being joined are stretched or when they are dissimilar—one old line, and one new one for example. When the line has been stretched, the length of lay (the distance along the length of the line taken by one strand to complete the circumfurence of the line) is also stretched, and the tucked-in strands will not stay in place in the line during rough usage. It is then necessary to use some method of keeping the tuck in place.

The long splice is also used to join parts of a cable-tool drilling line in most cases because it may become necessary to run a rope knife over the line if the tools become stuck in the hole. Sometimes, however, a "spudder" splice is put into the line. In this splice the strands are not put inside the line but are crossed, run through the line, and cut off leaving a small tag end outside the line. This bulky splice prevents the use of a rope knife.

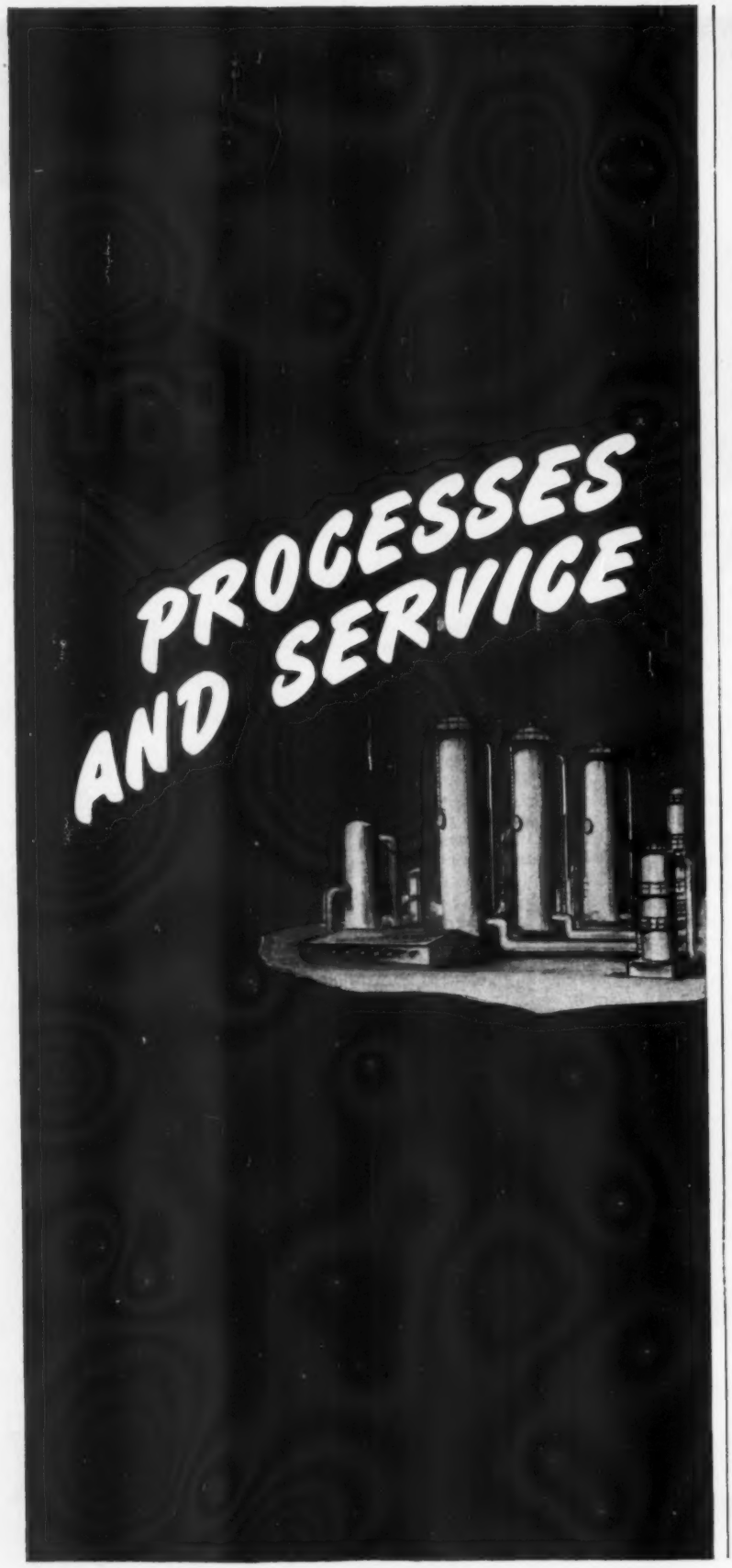
Another development in splicing is the conductor-cable splices for lines on which electrical surveying tools are run. These lines are of the non-rotating type, having two wraps of protective wire covering over the central rubber-insulated conductor wire. The protective covering consists of 18 separate small wires in each of two layers. The wires in the two layers are laid counter to each other—one set in one direction, the other in the opposite direction.

For this splice, the core of the pieces to be joined is bared for a short distance and joined together. This joint is then covered with raw rubber that is then vulcanized onto the wire and joined to the rest of the rubber insulation. Each of the wires in the protectives coverings is then laid back into position separately and the pairs of each of the pieces of cable are joined together by silver soldering. This last soldering is done very carefully so that the insulation of the cable core is not destroyed.

Wire-Line Slings

Small wire lines in the range of $\frac{3}{16}$ to $\frac{1}{4}$ in. are lending themselves to many applications in oil-equipment maintenance and use, particularly where a wire line is indicated but where a single large line is difficult to use. For handling heavy loads, several of these small lines braided together into a sling will be easier to use and just as strong as a single line. The braided lines lend themselves to hoisting operations better than a single one because of their great flexibility, and because the many strands offer a larger gripping surface to any object that is to be listed. Also, the braided sling will not kink. Casing slings are an example as are the braided slings in many machine shops. While the sling is being braided, the ends can be spliced or joined and many necessary attachments such as choker hooks, thimbles, loops, or fixed hooks put into it.

Braided slings can be made so that there are no loose ends to catch in clothing of workmen using them, the ends being hidden in splices placed in thimble. Also, since they are made of wire line, they will give visible signs of wear and imminent failure by showing loose frayed wire along their length. The strength and flexibility of the braided wire line has given them an application in safety lines for derrickmen. They are also used as pickup lines for drill pipe, and one operator has used a special sling and sister-hook arrangement to suspend the traveling block and elevators in the derrick while worn line is being removed from the draw-works drum.



Platforming Unit to Upgrade Kendall Straight Run—Add Facilities for Defense

By Howard V. Smith,
Refinery Superintendent
Kendall Refining Company

Our decision to install a 1500 barrel Platforming unit was made in recognition of the constantly upward trend of gasoline octane ratings for the knockless operation of increasingly higher compression motors. However, from the beginning possibilities inherent in this type of plant for the production of petro-chemicals were thoroughly explored and excess capacity was incorporated in the design so that modification could be made at a later date for that purpose.

Howard V. Smith

Competitive Situation Called for Higher Octane

A survey of gasoline quality in the nearby Pittsburgh area revealed the following average octane ratings for house brand and premium motor fuels:

	Research Method	*Motor Method*
House Brand	86.2	80.2
Premium	91.8	83.1

Bradford Grade Penna. crude, to which Kendall, being one of the largest producers of 100% Pennsylvania grade lubricating oils, is committed, contains a relatively high proportion of low octane gasoline and naptha which cannot be brought up to the above standards by the addition of tetraethyl lead alone.

This crude runs about 40% gasoline and naphtha, boiling up to 400°F. end point. Sulphur content is low and the combined product has excellent volatility. The research octane number is 50 clear and 70 with 3cc's TEL. Twenty-three per cent of the crude oil is available for cracking in the Dubbs continuous coking plant which yields 77 per cent of cracked gasoline and polymer on the charge. Thermal reforming of straight run naptha is included in the Dubbs plant operation.

All Processes Explored

Our engineers made a thorough study of available processes before reaching a decision that Platforming offered the most economical solution to our problem. Engineering studies showed that thermal reforming to the extent considered economical would still leave the anti-knock quality of the product short of the ultimate goal.

Pilot plant studies in the Universal Oil Products Company's laboratories demonstrated that the Platforming process would convert the 400 end point full boiling

range gasoline into 95 octane gasoline with 3cc's TEL, with a yield of more than 90 per cent by volume. Details of this pilot run are expressed in the following table:

Inspection of Kendall Straight Run, Fractionated Reactor Charge and Stabilized Platformate

	Full Boiling Range Straight Run Gasoline	*Reactor Charge*	*Platformate*
API Gravity	64.9	58.0	58.2
IBP	90	180	102
5%	117	201	134
10%	136	211	150
30%	198	235	188
50%	243	264	225
70%	290	306	262
90%	358	360	327
95%	381	377	364
EP	394	399	411
RVP	10.3	0.7	9.5
Octane Ratings			
F-1 Clear	50.1	40.2	84.1
F-1 3cc's TEL	69.7	61.2	95.3
F-2 Clear	49.5	38.0	78.8
F-2 3cc's TEL	69.5	60.8	87.9

Consideration of Defense Requirements

Another consideration was the fact that in the event of a drastic shift in requirements due to the impact of a defense or war economy on the nation, our Platforming facilities could be converted to the production of aromatics, aviation gasoline components, benzene, toluene and other petro-chemicals which might be needed for military purposes. While this conversion would require certain modifications in the unit itself, as well as additional feed stocks from outside sources, the change-over would not radically disrupt our operations and full utilization of the new unit would be possible.

Special Design Features

The plant design for our Platforming unit, incorporates some special features, particularly applicable to our circumstances. Since our charging stock is well fractionated and free from heavy ends, it was decided that a suitable reactor charge stock could be prepared from it by distilling off the light ends in a dependanizer. Utilization of this method instead of a prefractionator, reduced size of the equipment as well as the operating cost.

Air contamination of the charge stock will be minimized by blanketing the charge tanks with dry gas from the vapor recovery unit of the refinery. The dependanizer overhead will be depropanized to produce a blending stock for volatility control. Depropanizer overhead will be charged to the Platformer stabilizer to reduce butane loss. Recycle gas and reactor charge will be mixed before entering the heater and heated as one stream instead of separately.

Our new Platforming unit was designed by Universal Oil Products Company in collaboration with our engineering department. It is being erected by Procon Incorporated, and is expected to go on stream in March of 1951.

OVER 250
TOWER COMBINATIONS

FROM 258
PREFABRICATED
PARTS

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THE RIGHT TOWER...
AT THE RIGHT TIME...
AT LESS ERECTION COST

Whatever your cooling problem—process, gas or liquid—Fluor has the cell size and height to meet flexibility and operating requirements. From only 258 standard interchangeable prefabricated parts, over 250 *different* tower sizes and arrangements are possible—the result of over 30 years' experience in the design and manufacture of cooling towers to solve virtually every cooling problem in industries utilizing water as a cooling medium.

Fluor is the largest manufacturer of prefabricated cooling tower parts in the world—Here's what this means to you . . .

THE RIGHT TOWER, *guaranteed* to meet your specified requirements. The octagonal shape, true counter-flow design and "Spirodome" upspray distribution system of a Fluor Counterflo Cooling Tower offer greater cooling capacity per square foot of ground area than any other type tower available!

AT THE RIGHT TIME means just that. From an in-stock supply of prefabricated parts, the tower meeting specified requirements can be "packaged" for immediate shipment. Your tower delivered this way gets fast freight handling and erection upon arrival.

AT LESS ERECTION COST because all parts are marked for fast erection. There's no need for trial-and-error or cut-and-fit erection methods. Another saving is realized by the elimination of scaffolding. Extra heavy grid decking supported on 2″ x 4″ cross bracing—a feature of all Fluor Counterflo Cooling Towers—form the only scaffolding necessary for continuous erection.

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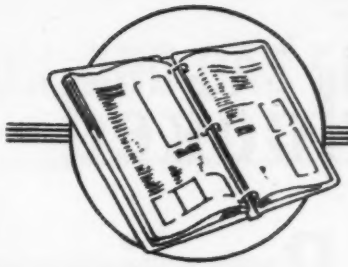

THE REFINER'S notebook

No. 61

How Grease Lubricates*—3

IT has been stated, in this series, that the shearing force which tends to disrupt the fiber structure of a grease, when the grease is worked, acts in the direction of bearing motion. This has been explained in terms of a person holding a deck of cards between the palms of his hands, then moving one hand outward so that the cards slide over each other in the direction of motion applied. Obviously, unless this force is enormous, it will not "squeeze" the cards out or tear them apart. However, the "shearing" motion of the moving hand acts in a direction parallel to the plane of the cards, causing them to glide over each other.

In much the same way one can imagine the grease in a moving bearing as separating into a number of ultrathin layers piled one on the other and sliding over each other just as do the playing cards. Some of the fibers in the soap lattice will lie across the "line of shear." These will either be broken or "combed out" until they are parallel to the direction of motion. Other fibers lying within the layer will be undisturbed and will provide "body" for the shear layer . . . just as the paper fibers in the playing card lie in the plane of the card and remain intact.

Within such layers of shear, the molecules of hydrogen oil behave much like individual molecules of oil do in an oil film—and since there are, roughly, about nine molecules of oil to one of soap in this layer, it is easy to imagine that the oil molecules and the physically similar free soap molecules behave in much the same manner, enabling these layers to have a definite thickness, and that the lattice structure in each is undisturbed.

This visualization of the grease, as forming into microscopically thin layers which maintain their individual lattice-like soap structure, helps one to understand the apparently contradictory facts that the grease appears to become quite fluid when in use but that this fluidity is evidenced only in the direction of the shearing force. It also helps to answer the question of how a grease can lubricate; how it can form a "fluid" film between moving bearing surfaces and yet be a plastic semisolid when at rest.

The foregoing discussion and analogies also help to explain why that portion of the grease clinging to the open ends of a bearing retains its jelly-like, semisolid form, thereby providing one of the most valuable assets of grease lubrication. It is this behavior that enables a grease to do that all-important task of sealing the bearing against the entrance of water, abrasive dust or dirt, and many other contaminants.

So far the conditions existing in a bearing while it is in motion have been considered. Now one must visualize what happens in the grease when the bearing motion stops and the grease is no longer being sheared. It can be imagined that any broken ends of soap fibers which were sheared when the grease formed into its tiny layers are still at the surface of each layer. Although there is no direct evidence that any of these broken soap fibers rejoin the shear line, it is logical to assume that this might be the case due to the effect of the molecular forces that brought about the fiber formation in the first place. Or, if one considers the shearing forces as having "combed out" the fibers, we may assume that these fibers (or some of them) may reorient themselves across the line of shear, much as a bent bristle on a brush will straighten when the bending force is removed.

The behavior of greases in this respect, however, is highly variable. The variable factor is the amount of working each grease must undergo before permanent breakdown of the fibrous soap structure occurs. The degree of resistance to breakdown under working is referred to as mechanical stability.

*From material prepared by Shell Oil Co. on "Fundamentals of Lubricating Greases."

Fig. 1—When a bearing is put into operation the principle of the lubricating wedge comes into play. This means that layers of grease are sheared off in the low-pressure area at the top of the bearing and drawn into the high-pressure area at the bottom. As a result a wedging action is produced which tends to lift the journal clear of the bearing and support it in this position.

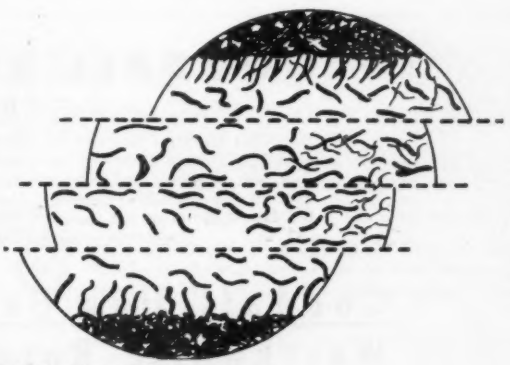

Fig. 2—The grease in an operating bearing can be visualized as being split into multiple layers which slide over each other in the direction of journal rotation. The number of layers into which the grease is sheared probably depends on a combination of many factors such as the speed of the journal, the viscosity of the oil used, the kind and amount of soap used, manufacturing methods, operating temperature, etc.

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When you buy rotary hose today, you buy a piece of equipment that costs approximately $1500.00 . . . . not a $25.00 accessory.

Yet, one break or rupture puts your entire investment on the junk pile! Is this economy? However, here's what happens when you buy Goodall Long-Life Flexible Cord Rotary Hose: Goodall Rubber Company is the only manufacturer that can protect your rotary hose investment . . . because the Barney Coupling is the only rotary hose coupling that can be rebuilt back into the old hose. Thus, if a Goodall Rotary Hose is damaged, we simply reset the Barney Coupling for a nominal cost and your hose is then ready for additional service. This is economy!

Consider these other exclusive features of Goodall Long-Life Flexible Cord Rotary Hose. It's competitive in price. Your Barney Coupling has a permanent salvage value. It's the strongest hose that can be built. The cord construction means extra drilling hours. It's flexible.

Can any other manfacturer match this Goodall economy and service? They cannot! So, in the light of these facts, why buy any other rotary hose? And never discard a Goodall Rotary Hose until you call us.

If you are not fully convinced of these facts, ask anybody who makes or sells rotary hose or write to me personally. We will contact you and fill in other details and answer your questions. Thanks.

Barney

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OIL AND GAS EQUIPMENT Digest

IT'S NEW CHECK IT

TRADE LITERATURE

1 MACHINERY FOR MANY APPLICATIONS. All types of machinery manufactured by the company are contained in a new 28-page, 2-color bulletin fully illustrated with installation and product photographs, Bulletin 187 also gives design data on two and four-cycle stationary and marine diesel engines, gasoline marine engines, and air and gas-compressor equipment. *Nordberg Manufacturing Co.*

2 ONE-HALF-YARD CRANE EXCAVATORS. A new 14-page catalog illustrates, in color, the heavy-duty line of Wayne Crane ½-yd. crane excavators. The newly completed line of ½-yd. excavators has lifting capacities ranging from 8 to 12½ tons. Each model is easily convertible to all front-end attachments. Gasoline or diesel power is optional. *Wayne Crane Division, American Steel Dredge Co., Inc.*

3 CHAIN DRIVES. This authoritative booklet is concerned with suggestions on how to install, maintain, and operate roller chain. It tells how to plan chain drive layouts; offers valuable hints on lubrication and roller chain selection. Also contains length-conversion tables, horsepower-rating charts, list prices with specifications for all types of roller chain. *Atlas Chain & Manufacturing Co.*

4 RECOOLING SPRAY NOZZLE SYSTEMS. The eight-page bulletin details design, application, construction, and operation of SK spray nozzles, and diagrams typical spray-pond arrangements. Sizes, dimensions, capacities, and spray-nozzle patterns are included in tabular form for each nozzle size. *Schutte and Koerting Co.*

5 FITTING AND FLANGE SHEETS carry data on welding fittings and flanges. One side covers the WeldELL line for every nominal pipe size, ½ through 30 in. It shows wall thickness for every weight of every fitting in every available material. The other side covers a complete line of forged-steel flanges for nominal pipe size, ½ through 24 in. *Taylor Forge & Pipe Works.*

6 SUBOX ANTICORROSIVE PAINTS covers the technical properties of an anticorrosive coating. The eight-page, multicolor brochure itemizes, point by point, the economies to be gained by use of the product. *Subox, Inc.*

7 BS&B LOW-TEMPERATURE SEPARATOR, a fully illustrated catalog, describes the outstanding features of a low-temperature separation unit designed to increase recovery in the stock tank of stable condensate. *Black, Sivalls & Bryson, Inc.*

8 SOLVING STEAM TRAP PROBLEMS contains helpful, practical information for engineers, contractors, and maintenance men who specify, install, or service steam traps. This new 36-page catalog contains specifications and capacities on the complete line of Super-Silvertop steam traps, Anderson float traps, air release valves, and pipe-line strainers. *V. D. Anderson Co.*

9 BUBBLE TRAYS AND CAPS FOR FRACTIONATING TOWERS. Sectional illustrations and line drawings

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Corresponding to new equipment items or trade literature abstracts in the Oil and Gas Equipment Digest of The Oil and Gas Journal, Mar. 1, 1951

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describe the structural features of Duo-Level trusses, bubble caps, and installation clamps and washers. *Gilbert & Barker Manufacturing Co.*

10 WIRE ROPE includes sections on selection, installation; grades of steel used; how to order; and thimbles, sockets, hooks, and clips. Also includes recommended practices in uncoiling, seizing, and splicing wire rope. *Broderick & Bascom Rope Co.*

11 SALIENT POLE ALTERNATORS covers constructional features and specifications of an alternator built for a range of outputs between 30 and 250 kva., suitable for coupling to any type of prime mover. *Brush Electrical Engineering Co., Ltd.*

12 HYSTER 20 LIFT TRUCK. This eight-page, two-color brochure includes complete operating data, annotated illustrations, and mechanical features of a 3,000-lb. lift truck. *Hyster Co.*

13 ODONTOGLOSSOM GRANDE is a four-color process print of the Tiger Orchid, suitable for framing. This is the floral illustration that appeared in a recent issue of The Oil and Gas Journal, to illustrate the work of a printing, lithography, advertising, and photography firm. *McCormick-Armstrong Co., Inc.*

14 MODEL HBA HIGH-COMPRESSION, BIG-ANGLE COMPRESSORS. Bulletin 104 covers 5, 6, 8, and 10-cylinder, 1,100 to 2,200-b.hp. super 2-cycle, right-angle, high-compression, gas-engine-driven compressor units. Annotated, sectional illustrations point out many outstanding features. *Clark Bros. Co., Inc.*

15 THE ARIDIFIER describes equipment that cleans and dries compressed air, removing 92 per cent of oil, water, and dirt from gas and air lines. Bulletin 1150 includes information on installation, selection, capacities, and dimensions. *Logan Engineering Co.*

16 PELTON OIL-INDUSTRY EQUIPMENT. A new two-color catalog covers a line of oil-industry machinery equipment. A complete treatise on the theory and operation of the long-stroke hydraulic pumping jack is included. Drawings and diagrams illustrate the text. A portion is devoted to the new beam unit, as well as various accessories. *Pelton Water Wheel Co.*

17 VINYL BASE EXTERIOR COATINGS is a well illustrated and documented bulletin on vinyl plastic coatings for the control of corrosion on exteriors of steel, concrete, brick, formed block and plywood structures and as a tank lining. Specific properties are given and a chemical resistance chart is included. *Casey & Case Coating Co.*

18 PIPE AND BOLT MACHINES. Sized for convenient handling and reference, it covers portable pipe and bolt machines, Model-A heavy-duty, Model-B utility model, and Model-E lightweight, economy model. Also shown are the power drives, Models C-1 and C-2, as well as the 102-PD pipe cutter and the No. 77 pipe threader that are designed for use with electric power drives. *Beaver Pipe Tools, Inc.*

19 NEW STANDARD SPECIFICATIONS FOLDER contains complete data on Towmotor fork-lift trucks, tractors, and electric pallet trucks. The four-page folder gives such information as capacities, load centers, lift heights, weights, dimensions, turning radii, and speeds of travel. *Towmotor Corp.*

20 REVISED FLANGE AND COUPLING SELECTOR lists such relevant facts as the outside diameter of flange, thickness, outside diameter of raised face, number of holes, diameter of holes, diameter of bolts, bolt circle, for Series 15 and 30 flanges. Also shows average sizes of standard, extra-heavy, 3,000-lb. and 6,000-lb. couplings. *Nooter Corp.*

21 NATIONAL CASING SUPPORT. The new National type "A" casing support, with slip-load capacity ranging from 65,000 to 160,000 lb. is featured in Bulletin 369, a three-color, four-page booklet which shows the casing support in section and indicates its main features. *The National Supply Co.*

22 TABLE ON TOLERANCES FOR ROUND CARBON AND ALLOY STEEL MECHANICAL TUBING gives permissible variations in diameter and well thickness. It refers to cold-drawn-unannealed and finished-annealed tubing in sizes to 8⅝ in. o.d., and to hot-finished tubing in sizes to 9⅝ in. o.d. *The Babcock & Wilcox Tube Co.*

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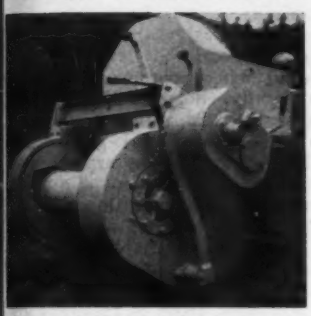
OIL AND GAS EQUIPMENT Digest

IT'S NEW CHECK IT

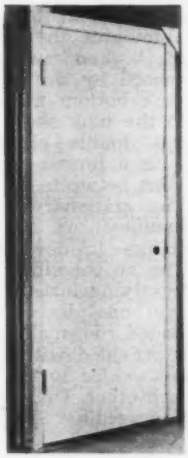
by Dan B. Miller

23 NEW OIL-WELL SERVICING WINCH for mounting on Caterpillar D4 tractors equipped with either fender or seat-mounted fuel tank, is designed for the many specialized jobs around shallow oil fields. Typical uses include pulling rods and casing, baling, and cleaning out and priming wells. The new winch has extra-large drum capacity of handling cable ranging from 3,480 ft. of ⅜-in. to 870 ft. of ¾-in. A two-piece drum divider flange is mounted on the drum barrel, permitting adjustment of the barrel length for required cable capacity. Surplus cable can be stored on one side of the divider, and spooled on the bare drum on the other when only a small amount of cable is used. The end of the transmission shaft also provides for mounting of any standard-type measuring spool. When necessary, the drum shaft can be removed without dismantling the winch. *Hyster Co.*

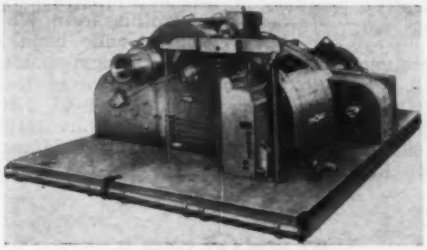


IT'S NEW CHECK IT

24 READY HUNG DOOR is a door-and-frame packaged unit, with the door hinged, lock installed, and frame trimmed on both sides. The unit is ready for immediate installation in any inside wall opening by semiskilled field labor. Similar to the packaged window unit, the Ready Hung door can be installed in 20 minutes, with only nail driving required. The jamb, with trim or casing attached, is made in two parts which slip apart for installation from opposite sides of the wall opening. Jambs are adjustable for wall thicknesses from 4¼ to 5½ in. High quality workmanship gives the unit the appearance of conventional frames when installed. *Houston Ready-Cut House Co., Inc.*



25 IDEAL TYPE 75-CA CONSOLIDATED RIG is designed for 650 input horsepower and is normally considered for drilling in the 6,500-9,500-ft. depth range.



New features and improvements include Dy-A-Flex air clutch for the high drum drive; air-operated Twin Disc model P air clutch for rotary drive; separate, centralized-control cabinet for air operation of the rig; 1½-in.-pitch quadruple engine-to-draw works drive chain; notched draw-works base for step-down location of drive group; and full enclosure and oil-bath lubrication of all chain drives. Air is used to control all of the major operations of the rig, including the catheads, drive group engine throttles and clutches, master clutch, inertia brake, and pump drive clutches. Two 46-in.-diameter by 10⅜-in.-wide water-cooled brake rims on the drum are made of roll-forged and heat-treated seamless alloy steel. The draw works provides six hoisting speeds, three rotary speeds, and three catshaft speeds. Three forward and one reverse speeds are provided by a two-shaft transmission. Speed selection is made through jaw clutches actuated from a single control lever. *National Supply Co.*

IT'S NEW CHECK IT

26 VACUUM FOR DRILL STEM TESTS. A vacuum which is applied to the conventional test tool is particularly valuable in testing low-pressure sands where the formation pressure is not great enough to expell infiltrated drilling mud. Vacuum assists in overcoming mud block and water lock, allowing formation contents to enter the test tool. This method is fast and easy to apply. *Leland W. Jones.*

IT'S NEW CHECK IT

The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

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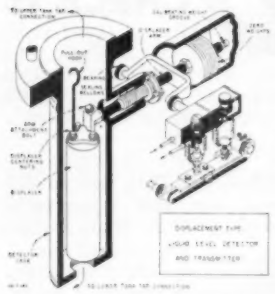
OIL AND GAS EQUIPMENT Digest

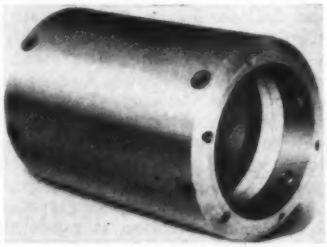
IT'S NEW CHECK IT



27 NEW LEVEL DETECTOR. A new displacement-type detector and transmitter utilizes a bellows seal, providing more precise and sensitive control of liquid levels. A non-indicating displacement-type detector and transmitter, it is employed with any pneumatic receiver of the indicating, recording, or controlling form. When used with a wide band proportional receiver-controller and a diaphragm motor valve, the result is smooth, friction-free, and accurate control of liquid level. Ranges are: 0-14, 0-32, 0-48, 0-60, 0-72, 0-84, 0-96, 0-108, and 0-120 in. and pressure ratings are 300 and 600 lb. *Brown Instrument Division, Minneapolis-Honeywell Regulator Co.*

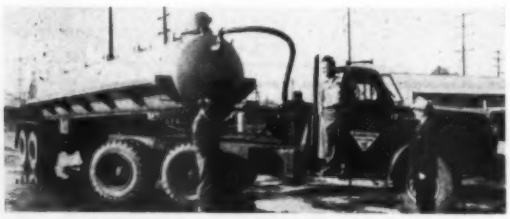
IT'S NEW CHECK IT

28 NEW WELD + END COUPLING is for quick, safe, and economical rejoining of crude oil, gasoline, L. P. gas, and gas pipe lines. Special design and construction permits the effective sealing of pipe from 2 to 36-in. diameter in a matter of minutes. Full pipe-line pressure can be restored immediately and welding done after line is back in service. The safety feature makes it possible to rejoin high-pressure steel pipe lines under hazardous conditions without using a torch due to the use of a mechanical seal with neoprene rings. Couplings are designed to withstand pressure of 1,200 psi. indefinitely when set manually and much higher pressures after welding. *E. H. Wachs Co.*



IT'S NEW CHECK IT

29 NEW TYPE HEAVY-DUTY DODGE TRUCK speeds the handling of rotary mud in oil-field drilling with a new Dodge YX-172 dual-drive tractor and 90-bbl.



semitrailer (over-all length 47 ft.) with a gross vehicle weight of 67,500 lb. With a 20-ton payload, this combination is capable of taking on 90 bbl. of mud in 10 minutes and unloading in 5 minutes. A catwalk, running the two lengths of the trailer, provides easy access to the five washout blades. Weight of the tractor with pump is 14,660 lb.; weight of the trailer, unloaded, is 12,660 lb. The 7 by 9-in. vacuum pump is driven by power takeoff. Other features of this Dodge truck are 10.00/20 12-ply tires and a No. 6031-D Brown-Lipe auxiliary transmission. *Pelton Motors, Inc.*

IT'S NEW CHECK IT

30 NO. 2099 AIR LINE RESPIRATOR. Recommended for such operations as paint spraying, welding, cleaning tanks, abrasive blasting, and similar work, it is especially useful where contaminants are unusually heavy. It protects against dusts, fumes, vapors, mists, smokes, and gases. No filters or cartridges are needed because a continuous flow of fresh air is directed through the hose. Features include the use of the R2000 respirator face piece, a 2½ ft. flexible, non-kinking, rubber breathing tube plus a 12½ to 50-ft. length of 5/16-in.-diameter air hose. Hose is resistant to oil, grease, or gasoline penetration. Air flow to the face piece is regulated by an adjustable valve clipped to the worker's belt or clothing. *American Optical Co.*

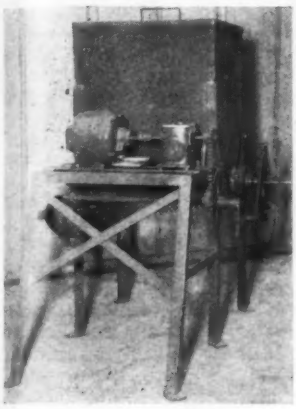
IT'S NEW CHECK IT

31 SWING JOINT FOR PETROLEUM STORAGE TANKS features a mounting arrangement which transfers all stresses to the tank shell only. This eliminates the possibility of broken swing joints caused by shifting of the tank bottom with respect to the tank shell. It is of the double elbow type, with a tongue-and-groove joint between the elbows. The stationary elbow is mounted on the nozzle flange inside the shell. The swivel elbow is held tightly against the stationary one by a spring-loaded rod, making a leakproof joint. The swivel elbow is provided with a boss which rotates in a thrust bearing welded to the shell by two arms at right angles to each other. During installation, these arms telescope before welding. *Shand & Jurs Co.*

IT'S NEW CHECK IT

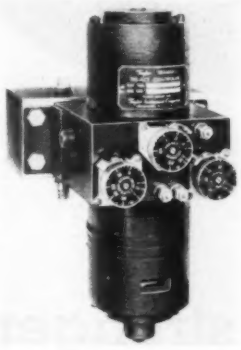
32 WESTERN CHEMICAL FEEDER is driven by the water entering the plant for treatment and adjustable to the correct amount of chemical for the quantity of water. The amount of chemical fed is increased or decreased by the amount of water passing through the feeder. Interruption of water supply automatically stops the feeder; feeder automatically starts again when flow

of water is resumed. Unit is made to order in various sizes, with water-wheel, gas-engine, or electric-motor drive. Model shown has agitator inside hopper for lime or other light chemicals. Spiral mixing bowls aid in putting chemical into solution. Use of solution tank in conjunction with the chemical feeder economically handles ferric sulfate, activated carbon, or other chemicals ordinarily difficult to dissolve. Feeder is adjustable from a few pounds to several hundred pounds of chemicals per day. *Pioneer Oklahoma Supply Co.*



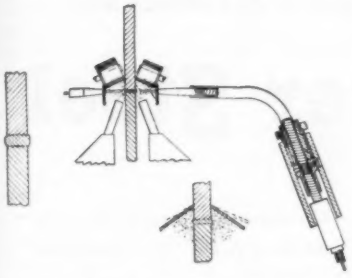
IT'S NEW CHECK IT

33 TRANSET TRI-ACT CONTROLLER for pneumatic transmission systems gives faster, more accurate measurement of rapidly changing temperatures and pressures; closer process control with stability; continuous process records on a 30-day strip chart; together with all other features needed for efficient remote control, all in a 4⅜ by 5-in. miniature pneumatic receiver. This new controller incorporates all the basic process control responses of conventional controllers but utilizes them in a different manner to give improved performance. Controller has ability to apply corrective action to the valve soon enough to prevent process conditions from overshooting or undershooting the set point. *Taylor Instrument Cos.*



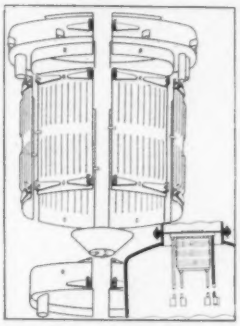
IT'S NEW CHECK IT

34 3 O'CLOCK WELDING PROCESS reduces the cost of welding and expands the possibilities for the application of hidden arc techniques, particularly to jobs where the joint is in positions other than that for downhand welding. The process consists of new methods, procedures, and equipment. Welds from both sides of the joint can be made simultaneously. Other advantages are a minimizing of distortion and weld cracking. Burn-through tendency is reduced and backup strips can be eliminated. Process is ideal for pipe fabricating, field erection of storage tanks, box sections, and I-beam and H-sections. *The Lincoln Electric Co.*



IT'S NEW CHECK IT

35 INTERNAL PURIFIER ASSEMBLIES. A line of 1, 5, and 11-piece internal upflow purifiers for use inside industrial evaporators and other large tanks, is designed to remove entrainment from vapors passing through. The units are made in three models. The first, Type AFE, is a one-piece unit for installation in evaporators with a large outlet nozzle through which it can be passed for assembly. Type AFD-1 is made in five parts for convenient installation through a large manway or similar rectangular space provided for access. An 11-piece assembly, AFD-2, is designed to permit installation in chambers where access may be made only through small outlet nozzles or cramped manways. *Centrifix Corp.*

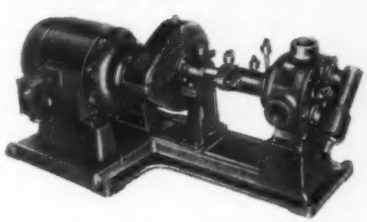


IT'S NEW CHECK IT

36 BALANSEAL, a new safety-relief valve, is an adaptation of the FarriSeal, which not only seals off guide, stem, and spring chamber, thus preventing corrosive damage to these parts, but also, by properly proportioning the bellows and disk areas, eliminates the effects of back pressure caused by multiple valves discharging into a common downstream header. This insures that the valve will relieve at the set pressure and also that the size of the downstream piping may be materially reduced because higher downstream pressure can be permitted. *Farris Engineering Corp.*

IT'S NEW CHECK IT

37 TOTALLY ENCLOSED ROTARY PUMPS have been developed to meet the need for capacities of 20, 35, 50, and 92 g.p.m. These new units are suited for pumping all types of clean liquids, either indoors or outdoors. Totally enclosed with oil-tight, water-tight guards, these new pumps can be used safely outside in all kinds of weather without a pump house when equipped with a totally enclosed motor as shown in illustration. Outstanding features of these new totally enclosed rotary pumps are: oiltight, cast-iron gear case with oil gage, filler and drain plug; combination flange and foot type, bronze bushed bearing; guard built to accept 17, 19, or 21-tooth pinion for available speed range; stainless-steel pump shaft; viking relief valve on pump head (optional). *Viking Pump Co.*



IT'S NEW CHECK IT

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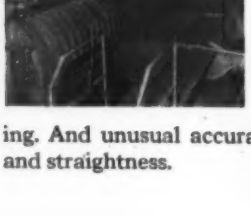
Water diet for stronger pipe



AFTER Basalt-Kaiser Steel large diameter line pipe has been formed and welded, it is expanded by *water* under great pressure in this modern hydraulic expander.

Result: Increased strength, due to additional cold working. And unusual accuracy in concentricity, diameter and straightness.

Kaiser Steel pipe, manufactured to conform to latest API specifications—in diameters from ½ inch to 30 inches, and in lengths up to 55 feet—is being produced. Shipping points are Fontana and Napa, Calif.

It's good business to do business with

Kaiser Steel

KAISER STEEL PIPE SPECIFICATIONS • All pipe manufactured to latest A.S.T.M. and A.P.I. specifications

Type	Diameter	Length	Wall Thickness	Shipping Point
Continuous Weld—Threaded and Coupled	½" to 4" nominal I.D.	Uniform 21'	Standard	Fontana, Calif.
Continuous Weld—Plain End	2⅜" to 4½" O.D.	Up to 40'	Standard	Fontana, Calif.
Electric Resistance and Fusion Weld—Plain End	8⅝" to 20" O.D.	Up to 40'	.188" to .500"	Napa, Calif.—Basalt-Kaiser
Electric Resistance Weld—Plain End	5½" to 12¾" O.D.	Up to 55'	.188" to .400"	Fontana, Calif.
Electric Fusion Weld—Expanded—Plain End	22" to 30" O.D.	Up to 40'	.188" to .500"	Napa, Calif.—Basalt-Kaiser

Prompt, dependable delivery at competitive prices • KAISER STEEL CORPORATION Los Angeles, Oakland, Seattle, Portland, Houston, Tulsa, New York

Pipe Lines

Plantation Awards Contract

ATLANTA.—A $1,500,000 contract for construction of stations and terminals required in Plantation Pipe Line Co.'s $52,000,000 expansion program has been awarded to Latex Construction Co. of Georgia.

The contract calls for enlargement of existing pump stations at Baton Rouge; Collins, Miss.; Akron and Silver Run, Ala.; Bremen and Center, Ga.; and Spartanburg, S. C.; and for enlarging existing terminals to handle the increased volume of products at all main-line points between Baton Rouge and Charlotte, N. C.

Plantation is presently expanding its facilities by the installation of 432 miles of 18-in. pipe (largest-diameter products line ever designed), and 275 miles of 14-in. line. The new line is being laid parallel to the company's present main line from Baton Rouge to Charlotte.

Capacity of the expanded system will be 167,000 bbl. per day of refined petroleum products—an increase of 72,000 bbl. per day over present capacity.

Steel for Lines Deplored

WASHINGTON.—A demand that the Federal Power Commission stop issuing certificates of convenience and necessity for steel to build natural-gas pipe lines has been made by the National Coal Association.

The coal group charged that it is unreasonable to permit these lines to be built in the face of current steel restrictions when at best they "can do no more than substitute one fuel for another." Furthermore, the association said, the coal industry is well prepared to meet all needs for fuel in all sections of the country, and the gas industry has proved during recent months that it cannot adequately serve its present customers.

Applications either approved or pending before FPC as of January 1 involve some 5,000,000 tons of steel—a sum five times as large as will be required by the coal industry for 1951, the association noted.

"Coal is needed to make steel for defense. Subsequently, this coal should not be required for the manufacture of steel pipe, which would in turn be used to put coal out of business," the group declared.

New Department Formed

INDEPENDENCE, Kans.—The formation of an oil-movements department, has been announced by Roy J. Tibbets, president of Sinclair Pipe Line Co.

The department will be headed by W. C. Rhodes, and will be charged with the task of coordinating all stocks and movements of crude oil on a system-wide basis. Rhodes joined the company in 1937 and has been chief dispatcher of the crude-oil-dispatching department.

Assisting Rhodes will be Paul Main, formerly a member of the administrative department in charge of tariffs for Sinclair.

Ohio Construction O.K.'d

WASHINGTON.—A $1,450,000 pipeline-construction project proposed by Lake Shore Pipe Line Co. in Pennsylvania and Ohio has been approved by the Federal Power Commission.

Lake Shore, of Cleveland, proposed to acquire, construct, and operate facilities which would carry gas into the northeastern Ohio area for the first time.

The company's project will include approximately 45 miles of 10¾-in. line extending northwesterly from a point of interconnection with Tennessee Gas Transmission Co.'s system near Meadville, Pa., to Ashtabula, Ohio, where it will connect with 27 miles of 10¾-in. from Ashtabula to Fairport. The 27-mile section to be acquired from Lake Shore Gas Co.

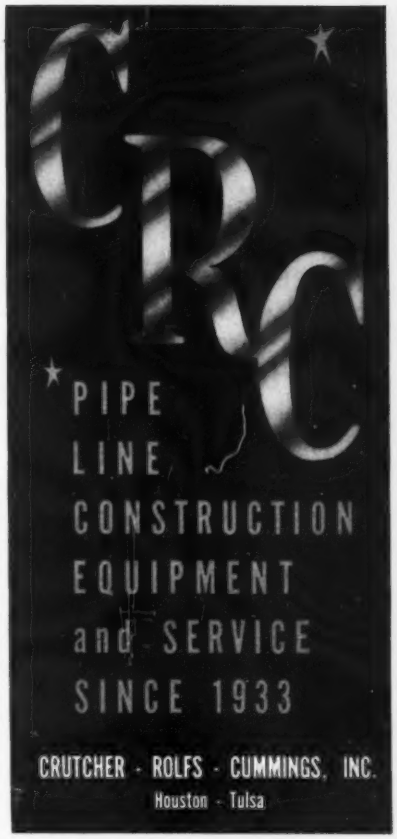
The commission concurrently denied applications of Erie Gas Service Co., Inc., of Oil City, Pa., and Grand River Gas Transmission Co., of Cleveland, which were competing with Lake Shore for the northeastern Ohio market. In the decision, FPC noted that a summary of the estimated total cost of service for the three proposed projects showed that Lake Shore could initiate the lowest rates.

Lake Shore will deliver and sell natural gas to Lake Shore Gas Co., Lake County Gas Co., Painesville; and Diamond Alkali Co., Painesville.

FPC Jurisdiction Lacking

WASHINGTON.—Iowa-Illinois Gas & Electric Co.'s application to construct a 1.5-mile, 8-in. pipe line across the Mississippi River linking two distribution districts located in two states has been dismissed by a presiding examiner of the Federal Power Commission for want of jurisdiction.

The line, from Bettendorf, Iowa, to Moline, Ill., was to supply gas from one district to another in either direction as circumstances should require. Cost was estimated at $70,000.



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CLEVELANDS rugged, all-welded frame and boom, made from the tougher steels, absorb all shocks and strains, keeping the drive units in alignment and assuring continuous dependable performance.

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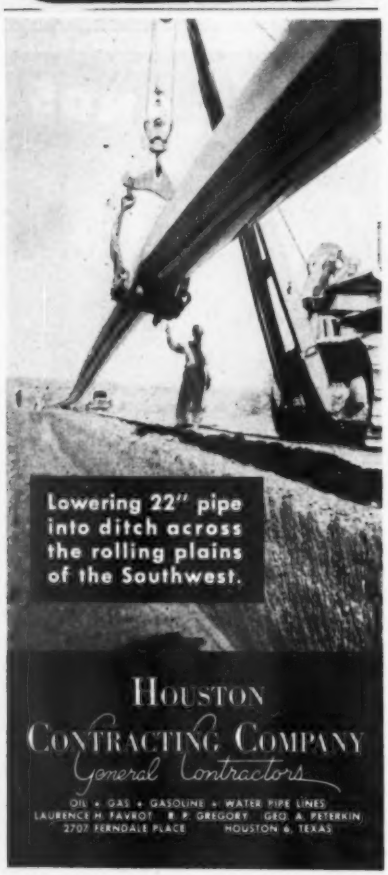

Lowering 22" pipe into ditch across the rolling plains of the Southwest.

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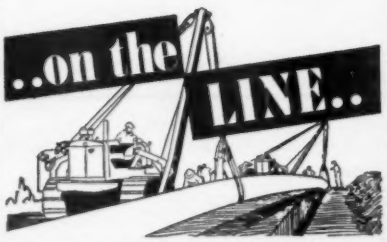

Williams-Austin Co. Plans Expansion This Year

WILLIAMS-AUSTIN CO. is engaged mostly in laying of natural-gas lines in the rugged terrain of Pennsylvania, West Virginia, Kentucky, and New York. It was organized in February 1949. Last year, the firm laid approximately 250 miles of pipe from 10 to 20 in. in diameter.

History. — G. Austin Manuel, president, came up in the pipe-line-construction industry with the Williams Brothers organizations, as did other key personnel of the company. Manuel's first pipe-line job was that of timekeeper for Booth & Flinn Co., of Pittsburgh. After participating in the laying of Cities Service Gas Co.'s line from Pampa, Tex., to Wichita, he joined Williams Brothers in April 1929, and was subsequently trained under S. Miller Williams, Jr.

In 1934 and 1935 he was spread man in take-up and lay work for Texas-Empire Pipe Line Co. From 1936 to 1940 he was engaged in construction for Northern Utilities Co. in Wyoming.

G. A. MANUEL

L. S. HINSON

He became manager of the Houston office in June 1944 and supervised the laying of 120 miles of 24-in. and river crossings for the original Tennessee Gas Transmission Co. line.

Len S. Hinson, vice president, and secretary-treasurer, was with a Bechtel organization in Venezuela when Bechtel Corp. participated with Williams Brothers in the construction of Mene Grande Oil Co.'s 100-mile, 16-in. line. After 4 years he joined the Williams Brothers organization and from there went to Williams-Austin.

Current operations.—Recent work includes 50 miles of 16-in. in northern Pennsylvania for New York State Natural Gas Co., and 42 miles of 20-in. for Central Kentucky Natural Gas

Reinforce your pipe coatings with Vitron
UNDERGROUND PIPE WRAP

An outstanding reinforcement that has helped form high-dielectric coatings on thousands of miles of pipelines, Vitron Underground Pipe Wrap gives you these time-saving, cost-saving advantages—

Higher Coating and Wrapping Speeds. VITRON Underground Pipe Wrap is extra-reinforced with parallel strands of high strength glass yarn.

Fewer Holidays. Uniform porosity gives even bleed-through of coating compound, allows holiday-forming gases to escape.

Greater Permanence. VITRON Underground Pipe Wrap will not rot or weaken under fungus or bacterial attack. It resists soil acids, absorbs no moisture.

Write for samples and descriptive engineering material.

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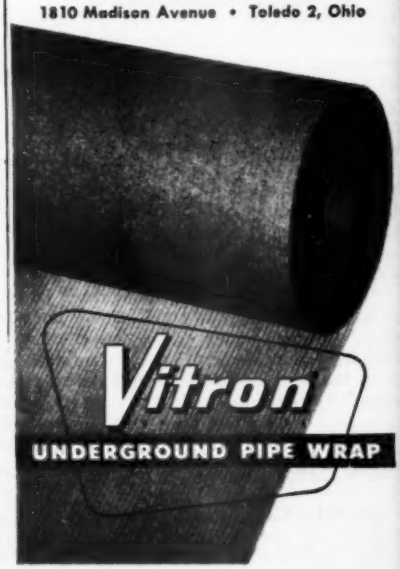

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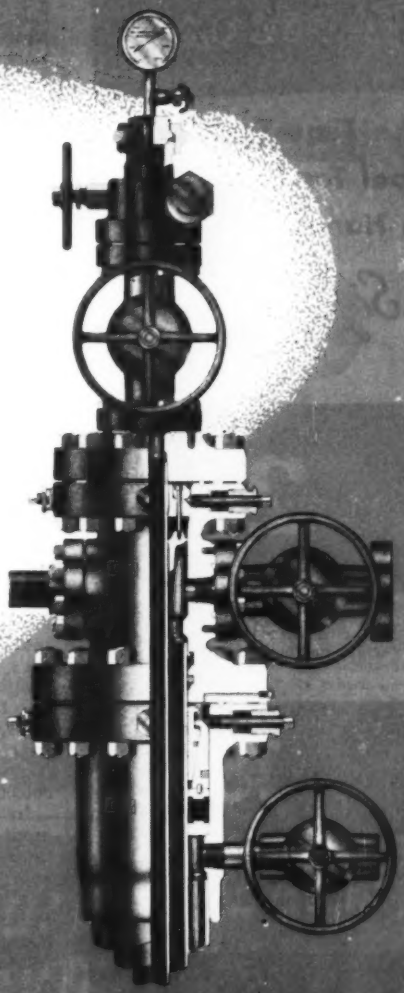
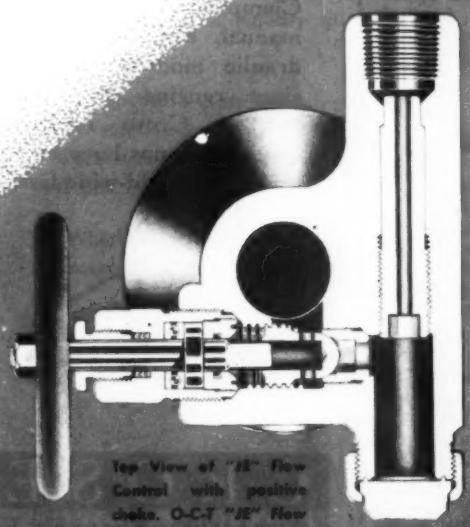
SAVE AS MUCH AS $300 ON EVERY TREE WITH THE O-C-T "JE" FLOW CONTROL



Here's how O-C-T "JE" Flow Controls effect this substantial saving without sacrificing safety or performance. This compact, easy-operating unit . . . adaptable to either positive or adjustable chokes . . . performs the functions and takes the place of a wing valve, Christmas tree cross or tee, adjustable or positive choke and the upper bottom hole pressure connection adapter. In addition, it eliminates the flange connections between the tee and the bottom hole test adapter, between the tee and the wing valve and between the wing valve and the choke. Thus, when used in place of a 10,000 lb. test conventional wing, the O-C-T "JE" Flow Control Unit effects a cost saving ranging as high as 90 per cent. Besides, it reduces weight as much as 70 per cent, provides quick wing valve replacement, greater ease of operation at high pressures and quick, easy field maintenance. *Can you afford to overlook the possibilities the O-C-T "JE" Flow Control Unit offers to save with safety?* Write for complete details or ask your O-C-T Representative. O-C-T "JE" Flow Controls are available through all recognized supply stores.



Top View of "JE" Flow Control with positive choke. O-C-T "JE" Flow Control Units are now proved in service by more than 3000 installations.

Oil Center Tool Co.

P. O. Box 3091, Houston, Texas

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Tapecoat in 24" width is the economical coal tar coating for "cigarette-wrapping" mechanical couplings.

18"

Tapecoat in 18" width—the size for "cigarette-wrapping" sleeves, large pipe bends and joints on large diameter pipe.

6"

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3"

2"

Tapecoat in 6", 4", 3" and 2" widths —ideal for spiral-wrapping welded field joints, service connections, pipe under streets and sidewalks, and pipe through building walls, etc.

Write for full details and prices on Tapecoat —the coal tar coating with a width for every purpose.

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489 Fifth Avenue, New York 17, N.Y.; Jas. E. Mavor Co., 514 M and M Building, Houston 2, Texas; 175 Niagara Street, Denver 7, Colo.

Co. near Brooksville, Ky. It is expected that most of the firm's work this year will be in Pennsylvania and New York where the heavy-construction season is from May 1 to November 1. Additional equipment has been procured to expand to three spreads this year from the two spreads operated in 1950.

Personnel. — Headquarters office of Williams-Austin Co. is at 707 Grant Building, Pittsburgh. Key personnel include William Van Norman, assistant treasurer; Ed Peters, general superintendent; and Ralph Caddy, Howard Bauer, and Leman Creech, spreadmen.

185-Mile System Planned

WASHINGTON.—In a fourth amended application filed with the Federal Power Commission, Carolina Natural Gas Corp., of Charlotte, N. C., is seeking authorization to build a system of pipe lines totaling about 185 miles in length, and having an aggregate design capacity of about 48,500,000 cu. ft. per day.

Estimated cost of the proposed facilities is $3,595,295. Carolina Natural's requirements are estimated as ranging from a peak day of 16,300,000 cu. ft., with an annual volume of 4,644,000,000 cu. ft. during the first year, to a peak day of 32,600,000 cu. ft., with an annual volume of 7,568,000,000 cu. ft. in the fifth year.

In January FPC authorized Piedmont Natural Gas Co., Inc., of Spartanburg., S. C., to serve certain markets in the Carolinas, but denied applications of Carolina Natural and Public Service Co. of North Carolina, Inc., of Gastonia, N. C., insofar as they related to serving markets Piedmont was authorized to supply.

The commission at the same time reopened the proceedings involving Carolina Natural and Public Service to afford those companies an opportunity to file amendments to their applications eliminating the communities Piedmont was authorized to serve.

More Hearings on Old Line

WASHINGTON.—Hearings on the use of a 30-year-old gas pipe line across Lake County, Ohio, will be reopened by the Federal Power Commission, according to Rep. Frances Bolton (R., Ohio) who said she has had assurances to that effect from FPC.

The congresswoman said the commission assured her consideration would be given to petitions of Grand River Gas Transmission Co. and Erie Gas Corp., both of which want permission to lay line across the territory.

The new natural-gas line if approved would tie into the natural-gas facilities of Tennessee Gas Transmission Co. at Meadville, Pa.

CROSE

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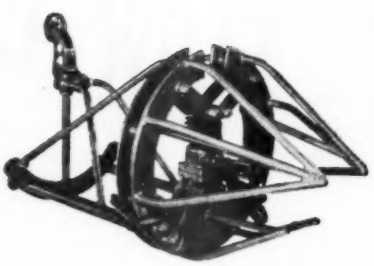

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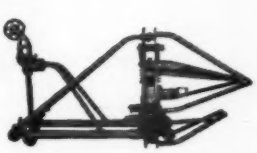

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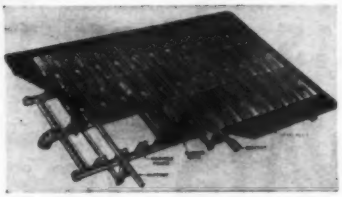

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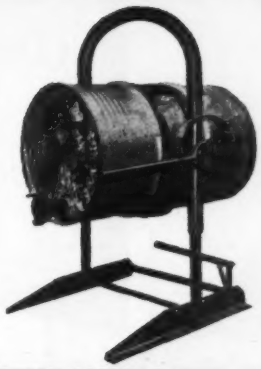

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REFINING

Platformer On Stream Soon

BRADFORD, Pa.—The first Platforming unit in the East, a $900,000 plant now under construction for Kendall Refining Co. here, is scheduled to go on stream soon.

The unit will have a maximum throughput of 1,200 bbl. per day of low-octane, low-boiling petroleum fractions, and will produce high-octane gasoline. It has been designed to produce fuels capable of meeting requirements of automobile engines of higher compression ratios than the 1951 models, if such fuels should be required in the future.

The Kendall refinery has a crude-charge capacity of 5,000 bbl. per day. Through the year ending October 31, 1950, refinery runs of Pennsylvania Grade crude oil to stills averaged 3,903 bbl. per day. Other major refinery installations include a 5,000-bbl.-per-day thermal cracking unit, and a 750-bbl.-per-day reformer.

Union Builds New Terminal

VENTURA, Calif.—A new marine terminal is under construction near here by Union Oil Co. that will send Ventura County crude oil through a new 8-in. pipe line to the sea. The terminal also will serve as a distribution center for gasoline and other products brought to Ventura by tankers calling for cargos of crude. *(The Oil and Gas Journal, February 8, 1951, page 64).*

A 10-acre site south of the city near the mouth of the Santa Clara River has been purchased for the terminal, and pump house and four storage tanks for products will be erected there.

Tanks include one 135,000-bbl. tank for crude storage, two 30,000-bbl. tanks for gasolines and a 10,000-bbl. unit for diesel fuel. Two diesel-driven pumps will handle upward of 12,000 bbl. of crude per hour between shore and ship, enabling a tanker to load in 10 hours.

Crude from storage tank to ship will be pumped through 20-in. cement-lined pipe which will extend 4,000 ft. under the sea to an offshore buoy. A coating of asphalt, felt, and cement will protect the line's exterior from salt-water corrosion.

Paralleling the crude-oil line will be an 8-in. line for refined products. The products will be pumped from ship to terminal through discharge pressure of the ship's pumps. While loading crude, the same tanker will be discharging gasoline or diesel fuel.

Crude-Oil Supply Sought

FORT WORTH.—The Texas City refinery of Petrol Refining, Inc., will be ready to resume operations by March 1 if a source for sufficient crude-oil supplies can be found.

The refinery is being reopened after a 15-month shutdown, to produce 100 to 130-octane aviation gasoline for the Armed Forces.

E. W. Neason, of Oil Trading Co. of Texas, the firm representing Petrol on purchases of crude and sales of products, told the Texas Railroad Commission recently that his company must find a sources of from 25,000 to 30,000 bbl. of crude per day to permit the refinery to reopen.

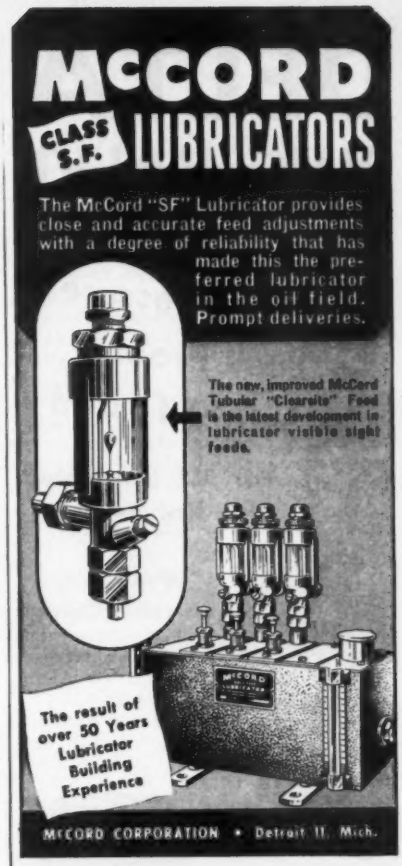
Neason said he has discussed Pe-

NELSON REFINERY CONSTRUCTION INDEX

Appears in the first issue of each month.
Explanation—Cost-imating No. 61, December 15, 1949, pages 91, 92.
Compiled by W. L. Nelson—Refinery Consultant—Tulsa.
Indexes of Individual Equipment Items—January, April, July, October.

INDEX (1946 = 100)

	1947	1948	1949	Nov. 1950
Centrifugal pumps	109.0	120.0	118.9	133.7
Reciprocating pumps	128.5	138.1	144.6	154.4
Compressor	114.0	128.0	120.0	125.9
Engines	109.0	120.0	115.5	123.2
Motors	110.0	112.7	114.0	135.3
Transformers	116.0	116.0	116.0	123.4
Instruments	113.0	120.0	122.0	133.8
Miscellaneous equipment average	114.2	122.1	121.6	132.8
Materials component	122.4	139.3	143.6	163.8
Labor component	113.5	128.0	137.1	147.6
Refinery construction index	117.0	132.5	139.7	154.1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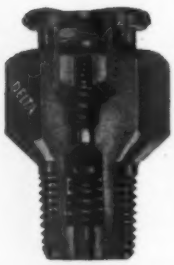

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trol's crude-oil needs with several prospective sellers but to date has been unable to receive a definite commitment.

The refinery was constructed by Defense Plant Corp. during 1944, and was purchased by Petrol Terminol Corp. on September 1, 1948.

The Houdry fixed-bed catalytic unit is now being reactivated, and plans are under way to activate an H-F alkylation unit. Other products will include 86 and 92-octane motor fuel, kerosine, No. 2 fuel oil, diesel oil, Bunker "C," and some excess isobutane. The payroll is now about 150 men.

Present officers of Petrol include: V. A. Fogg, president; William H. Fetter, vice president and general manager; and William J. Fields, secretary-treasurer. D. E. Fuller is superintendent.

Sovereign Service Expands

WICHITA.—Shallow Water Refining Co. has joined the group of Sovereign independent refiners, it has been announced by C. R. McPherson, manager of Sovereign Service, Inc., who said the move will greatly expand Sovereign operations in western Kansas and eastern Colorado.

Shallow Water Refining, with headquarters in Garden City, Kans., completed a $300,000 program of modernization last spring. The remodeling involved work on a thermal cracking furnace and cycloversion unit, and addition of a reformer. The refinery has a capacity of approximately 2,500 bbl. per day, and is running near capacity. The company will market gasoline, kerosine, diesel fuel, and other petroleum products under the Shallow Water brand and the Sovereign Service trademark.

Three other Sovereign independent refineries in the area include Vickers Petroleum Co., Inc., Wichita; Eldorado Refining Co., Eldorado, Kans.; and Kanotex Refining Co., Arkansas City, Kans.

Negotiations Under Way

HOUSTON.—Negotiations are under way which will give Mayfair Minerals, Inc., a half interest in Taylor Refining Co.'s Port Isabel refinery in South Texas.

Mayfair and Taylor are already associated as Taylor-Mayfair in McAllen field and in the operations of the McAllen cycling plant. The Port Isabel refinery is undergoing a complete overhaul which will increase its throughput from 6,000 to 10,000 bbl. daily.

The refinery was built in 1935 to process crude from Willamar and Rincon fields. Construction is well under way on the present revamping of the plant. Included in the work is the installation of a 4,000-bbl. Platforming unit.

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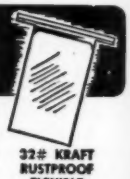

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NATURAL GAS

Gas-Storage Pool Sought

WASHINGTON. — Tennessee Gas Transmission Co., of Houston, and United Natural Gas Co., of Oil City, Pa., have filed a joint application with the Federal Power Commission to construct facilities necessary to develop and utilize an underground-storage area for natural gas in Hebron field, Potter County, Pennsylvania.

The proposed project would cost an estimated $7,757,200, and include 70 wells, the same number of well-measuring stations, and approximately 89,530 ft. of pipe lines.

The area, when fully developed, would have capacity to store 22,500,000,000 cu. ft. of gas, and a deliverability of 225,000,000 cu. ft. per day. Tennessee is also seeking permission to inject approximately 23,800,000,000 cu. ft. of cushion gas into the storage area.

Tennessee would use the proposed facilities to make available an additional 200,000,000 cu. ft. of gas per day during periods of maximum customer demand. Nearly all of this amount would go to Northeastern Gas Transmission Co. to serve additional customers in New England under a proposal now being considered by FPC, if it is granted.

Otherwise this gas would be used to satisfy the demands of Tennessee's customers, present and proposed, and to provide flexibility along the company's system.

United proposes to use the facilities to handle peak loads.

Source for Sulfur Sought

WASHINGTON. — Possibilities for building one or more plants in West Texas to reclaim sulfur from sour gas are being investigated by Phillips Chemical Co., of Bartlesville, Okla., L. L. Jaquier, of the company, told a House subcommittee last week.

Jaquier said the plants would not be economical, but that Phillips would erect them if the Government guarantees the company that it can use the sulfur to make ammonium sulfate in its Houston plant. Production there has been cut back 35 per cent.

Dr. James Boyd, defense-minerals administrator and head of the Bureau of Mines, said the sulfur shortage has been estimated as high as 500,000 long tons. Supply is declining while demand climbs, he said.

Carbon-Black Plants O.K.'d

BATON ROUGE.—The state conservation department of Louisiana has granted permits to Cabot Carbon Co. for the construction of three carbon-black plants in St. Mary Parish.

The three plants, one each of the thermal, furnace, and oil-furnace types, will be built just north of the intracoastal canal at North Bend, near Bayou Sale.

Granting of the application followed a public hearing held January 25, at which a delegation of Franklin and St. Mary Parish citizens endorsed the project.

Curbs on Gas Use Sought

CINCINNATI.—Walter C. Beckjord, president of Cincinnati Gas & Electric Co., has appealed to the Cincinnati City Council to forbid further issuance by the city of gas-heating-installation permits unless approved by the company.

A law on this order is needed to avoid serious interruptions to industrial operations and would be vital to all-out war production, he said.

Cincinnati has had three gas shortages during the periods of intense cold this winter.

FPC Bypasses Proceeding

WASHINGTON.—Northeastern Gas Transmission Co.'s request for the omission of intermediate proceedings involving its petition for authority to substitute larger-sized pipe in portions of its New England natural-gas system has been approved by the Federal Power Commission.

The case will bypass the filing of an intermediate decision by the presiding examiner and will now go directly to the FPC for final decision.

Northeastern wishes to substitute 24-in. line for the 20-in. line previously authorized for 144 miles of its main system in Massachusetts, and to use larger-sized pipe on several lateral lines.

Gas Changeover Completed

NEW YORK.—South Jersey Gas Co. has completed conversion of its system from manufactured to straight natural gas supplied from the newly completed Texas-New York line of Transcontinental Gas Pipe Line Co.

Deliveries of natural gas to the company began about January 4, but about 6 weeks were required to make the necessary changes in approximately 110,000 appliances of its 60,000 customers. The company is working on plans to extend natural-gas service to other areas of southern New Jersey.

South Jersey's conversion to straight natural gas is in contrast to plans of most of the other utilities taking Transcontinental deliveries. For the present at least, these companies are using the natural gas to enrich the manufactured product.

Natural Gasoline

Big Registration Expected

A registration of more than 1,100 persons is expected for the thirtieth annual convention of the Natural Gasoline Association of America in Tulsa April 25-27, according to W. A. Baden, president of Anchor Petroleum Corp., chairman of the program committee.

Baden said special arrangements are being made to take care of an unusually large attendance at the convention, which is the first to be held in Tulsa in 10 years.

Program plans call for addresses by leading figures in aviation and in the oil-preparedness organization in Washington. Technical papers dealing with current production problems of the natural-gasoline and cycling industries also are scheduled to be presented.

Other members of the program committee as announced by James E. Pew, N.G.A.A. president, Sun Oil Co., Philadelphia, are: Robert Boykin, Fullerton Oil Co., Pasadena, Calif.; Allen T. Givins, Coltexo Corp., Monroe, La.; H. W. Harts, Warren Petroleum Corp., Tulsa; T. W. Legatski, Phillips Petroleum Co., Bartlesville, Okla.; M. L. Mayfield, Hiwan Oil & Gas Co., Houston; Howard B. Shelton, Sohio Petroleum Co., Oklahoma City; Ben H. Williams, J. S. Abercrombie Co., Houston; and John F. Lynch, La Gloria Corp., Corpus Christi.

L.P.G.A. Program Readied

CHICAGO.—Nearly 2,000 persons from all parts of the nation and many foreign countries are expected to attend the 1951 convention of the Liquefied Petroleum Gas Association here May 7-10, Howard D. White, executive vice president, has announced.

The annual event, marking the organization's twentieth anniversary, will be keynoted by speeches on industry problems growing out of the national emergency, and on sales promotion.

Already scheduled for appearance at general sessions are James E. Pew, Philadelphia, manager of the natural-gas and natural-gasoline division, Sun Oil Co., and president of the Natural Gasoline Association of America; and Lee A. Brand, Belleville, Ill., vice president of Empire Stove Co. and chairman of the national committee for L.P.G. promotion. Pew will discuss the impact of the present international situation on the industry, while Brand will give a progress report on the national L.P.G. promotional program.

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Among the Drilling Contractors

Illinois Rig Goes to S. A.

C. J. Simpson, Mattoon, Ill., contractor and operator, has left with a rotary rig and drilling crews for Colombia, S. A., where he has a contract for an exploratory test to be drilled in the Monteria area. In addition to the contract, Simpson has an operating interest in the project.

Training Plan Helps West Coast Drillers

The training program for toolpushers and drilling crews sponsored by the American Association of Oilwell Drilling Contractors has been adopted by two West Coast companies. The two companies, Brown Drilling Co. and California Production Service, Inc., both of Long Beach, cooperatively started the program the first of the year.

Both report that excellent progress is being made and that profitable results are already apparent. Instruction is being carried out by Mel Curtis, extension division of the University of Texas.

During the association's 2-year trial program many participating oil-well drilling contractors over the country found that their accident frequency and severity rate were reduced as a result. Two companies reported a reduction in accidents, frequency, and severity in the order of 50 per cent.

Delta Gulf Changes Gulf Coast Key Men

J. Zeppa, president of Delta Gulf Drilling Co., Tyler, Tex., has announced changes in the top operating personnel of the company's Gulf Coast division with headquarters at Houston.

R. C. Wilkins, who has been superintendent of the division, has resigned to devote his entire time to Win Hawkins Drilling Co. of Houston, in which company he is financially interested. He has been succeeded by Roy D. Garner, who joined the company several months ago as assistant superintendent. Previously, Garner had been associated with Wynn Crosby Drilling Co. and the J. S. Abercrombie Co., both of Houston.

W. M. Ault, previously a toolpusher with the company, has been appointed field drilling superintendent under Garner.

ROTARY RIGS IN OPERATION*

Area—	Week ended 2-19-51	Chenge week ended 2-12-51	Chenge week ended 2-20-50
Gulf Coast	501	+ 8	+ 15
W. Tex.-N. M.	745	— 1	+ 64
Ark.-N. La.-E. Texas	127	— 1	— 1
Oklahoma	244	—15	+ 17
Kansas-Nebraska	144	+ 4	+ 44
Illinois-Eastern	73	—33	+ 13
Rocky Mountains	194	+ 3	+ 44
Pacific Coast	135	+ 3	3
Total U. S.	2,073	—32	+196
Western Canada	102	—11	+ 22
Total	2,175	—43	+218

*Courtesy Hughes Tool Co. Trends in drilling activity in the United States as a whole and the Pacific Coast and Illinois-Eastern areas are shown by charts on pages 128 and 129.

Holmes Drilling Co., Houston, is starting a projected 8,250-ft. test for Magnolia Petroleum Co. at 1 Ostrum, located in Lot 6, Tex-Mex RR Survey, Hildalgo County, Southwest Texas.

Dixie Drilling Co., Dallas, has contracted with Union Oil Co. of California for a 11,680-ft. well to be drilled in Tigre Lagoon field, Vermilion Parish, Coastal Louisiana. Location is for 1 Elia Dugas, in 31-13s-5e.

Appell Drilling Co., Alice, Tex., is undertaking a 6,500-ft. wildcat test for its own account at 1 Sam Stockbridge, located in Porcion 9, approximtely 16 miles northwest of Laredo, Webb County, Southwest Texas.

Dickson Drilling Co., Houston, has the contract for a projected 8,500-ft. test which Fifteen Oil Co. will drill in Charenton field, St. Mary Parish, Louisiana. Location is in 29-13s-10e for 2 Grand Lake.

Arrow Drilling Co., Dallas, has a 10,000-ft. drilling contract on the wildcat test which The Texas Co. is starting at 1 Love, in Jesse Korn Survey, 5 miles east of Fairfield, in Kaufman County, East Central Texas.

Sharp Drilling Co., Midland, Tex., has a heavy-duty rotary rig on a wildcat location 13 miles north of Lubbock, in Lubbock County, West Texas, where it is starting a projected 10,000-ft. test for Standard Oil Co. of Texas. The location, in Section 10, Block D, L&SV Survey, is for 1 Fynn. It is 2½ miles northwest of the Cravens field.

Sojourner Drilling Co., Abilene, Tex., has a rig running for **West Cen-**

tops in the oil country

Prevents pipe threads from galling and seizing—protects threads—lengthens life of drill string. Those are reasons why 'Bestolife Lead Seal Tool Joint and Casing Compound has been tops in the oil country for 20 years. Unconditionally guaranteed. Sold and exported by supply houses the world over.

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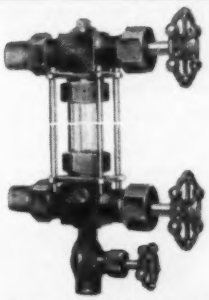

Extra heavy construction throughout. Body made from special high strength alloy iron, shanks alloy steel and trim stainless steel. Automatic and positive shut-off if glass breaks, valves self-cleaning, dripless drain cock permits gradual blowing off of gage. Conforms with A.P.I.-A.S.M.E. requirements.

The Heavy Duty "All Iron" is one of the complete line of Penberthy gages that meets every liquid level gage requirement.

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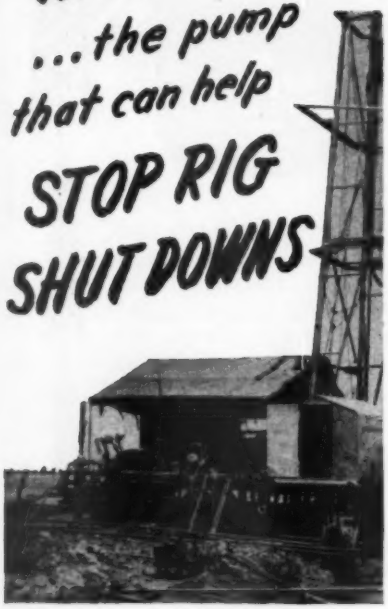
Marlow "MUD HOG" ...the pump that can help STOP RIG SHUT DOWNS

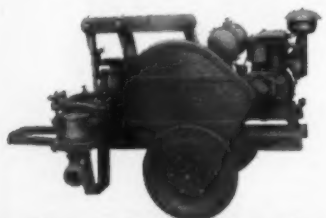


With this famous diaphragm pump on the job you don't need to shut down your rig to clean cuttings from pits, mix muds or pump water. What's more, your slush pump is free to stay on its profit-producing job — circulating drilling mud.

At your rig a Marlow "Mud Hog" can:

Eliminate jets to clean pits
Reduce costly drilling-mud loss to waste pit
Cut down water loss to waste pit
Mix mud and feed slush pump directly . . . eliminate unused mud at slush pump suction
Transfer water from waste pit
Supply water at low pressure

A Marlow "Mud Hog" is the unrivalled "tough baby" of the oil country. Write for complete details about this dependable money-saving pump.



MARLOW PUMPS
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Engineers and Representatives Everywhere

tral Drilling Co. in the Old Glory field, Stonewall County, Texas. Current operation is on 1 Johnson, a projected 6,000-ft. test in Section 6, AB&M Survey.

Morris & McCutcheon. Wichita Falls, has the contract on San Juan Oil Co. 1 Scott, a Mississippian wildcat test, located in the BS&F Survey, north of Olney, Archer County, North Texas. Contracted depth is 5,300 ft.

Parish & Coon, Inc., Houston, has contracted for a 6,000-ft. wildcat test, 1 Schueneman, to be drilled for Harold Link and associates in Section 18, H&TC Survey, 2 miles west of Needville, Fort Bend County, Texas Gulf Coast.

W. W. Zimmerman & Co., McAllen, Tex., has started a 4,500-ft. wildcat test approximately 1½ miles west of the Rincon field, Starr County, Southwest Texas. The venture, 1 Maresh, is being drilled under contract for the Gerker Oil Field Co. of McAllen. Location is in the CSSD&RGNG RR Survey.

Brewster-Bartle Drilling Co., Houston, has a rig working on a 12,000-ft. wildcat test being drilled for its own account in the Samuel Carter Survey, Brazoria County, Texas Gulf Coast. Name of the test is 1 Munson.

Prince Drilling Co., Houston, is drilling below 5,400 ft. on a projected 8,250-ft. wildcat test in the Burrell Jones Survey, Jefferson County, Texas Gulf Coast. The well is 1 Garth, and is being drilled under contract with H. B. Hebert and associates of Houston.

R. M. Bass. Kilgore, Tex., has a rig on a wildcat location 8½ miles northeast of Fairfield, in Freestone County, East Central Texas, where it is drilling for Humble Oil & Refining Co. Name of the test is 1 McAdams. Location is in the M. Autrey Survey.

Gabbert & Jones Drilling Co., Great Bend, Kans., is drilling on a wildcat location northwest of the Northeast Medicine Lodge gas pool in Barber County, southern Kansas. The test is being put down on a contract with Orville H. Parker. Location is for 1 Alexander, in the C SE NE 6-33-12.

Morrison Drilling Co., El Dorado, Kans., is drilling for Bay Petroleum Corp. at 1 Lucas, a wildcat test located in the NW NW SE 23-28-6e, south of the McCaig pool, 12 miles southeast of Augusta, Butler County, Kansas.

Whitehurst Drilling Co., Inc., Shreveport, contracting for Murphy Corp., is drilling a west offset to the discovery well of the recently opened North New London field, Union County, Arkansas. The operation is 1 Burgess, C N½ NE NW 33-17s-12w. Contract is for 5,100 ft.

Pickrell Drilling Co., Inc., Wichita, has a rig running for Derby Oil Co. and associates on a wildcat location near Stuttgart, south of the Dayton pool, Phillips County, northern Kansas. Location is for 1-A Miller in the SE SW SE 15-3-19.

Sam Richardson, El Dorado, Ark., has a contract with Lion Oil Co. to drill a Smackover lime test on a wildcat location in the C SW SE 28-18s-18w, 12 miles west of Wesson, Union County, Arkansas. Contract is for 8,400 ft.

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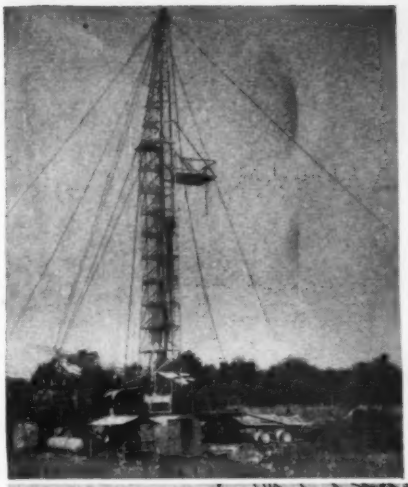
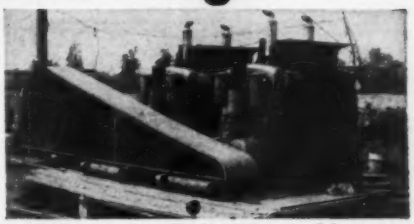


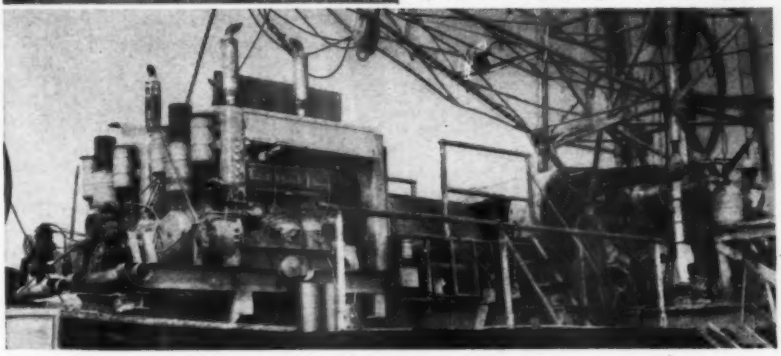
Beene-Hurley Use Low Cost Power on Frank's Rig!

Drillers Beene and Hurley at Bossier City, La., use Frank's portable rig with four Minneapolis-Moline 1210-12A units for power. They are drilling low-cost wells to depths of 6500 feet. The 1210-12A, 12 cylinder unit engines are factory equipped to operate on LP gas or natural gas—the low priced fuels in this area.

Beene and Hurley have mounted two of these units on the drilling table to furnish power to the draw works. These engines are equipped with front power take-off drives and supply 400 hp with LP gas. The other 1210-12A units are remotely located on the mud pump. The complete engineering and installation was done by Beene and Hurley at Shreveport.



Mud pump installation is powered by two MM 1210-12A's.



Two MM 1210-12 on the drilling table operate on low-cost, higher octane LP gas.

This arrangement combines flexibility of layout with important time saving for setting up the rig. Precision tooling and high production methods account for the extremely low selling price of MM heavy-duty oil field power units. Standardization of parts permits interchangeability which assures easier, lower-cost maintenance.

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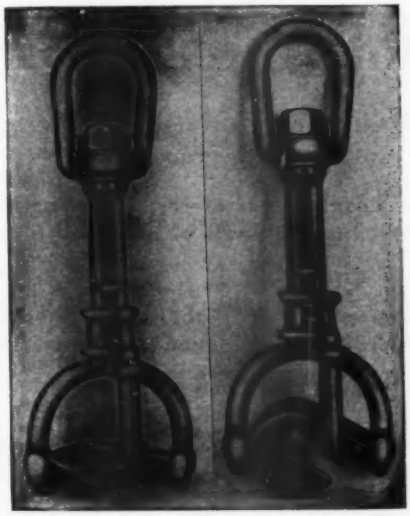

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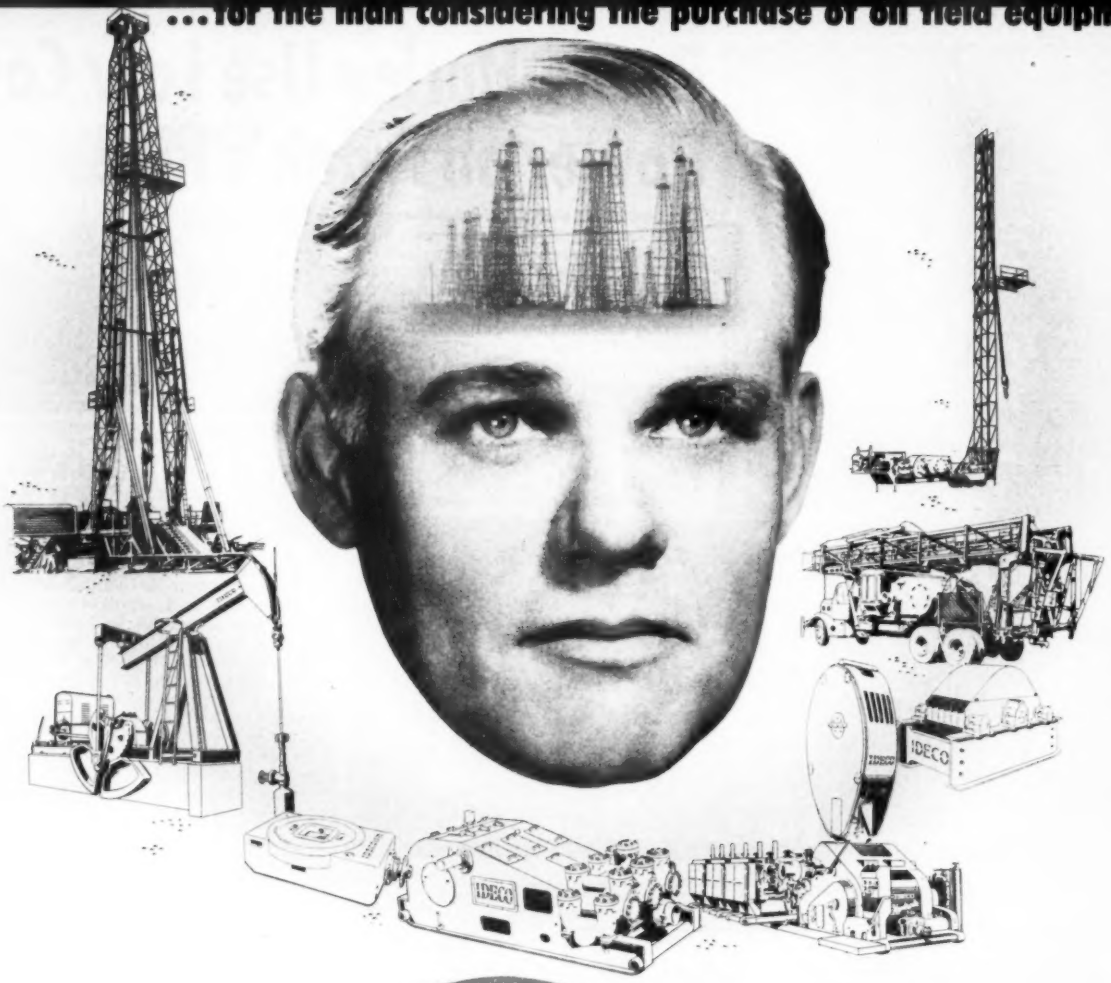

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REPORTS ON

Exploration and Drilling

Forest City Basin Notes

THE Forest City basin is packed with rocks which produce oil in other parts of Kansas. Generally recognized as offering possibilities for commercial production in this basin are the Lansing-Kansas City, the sands of the Cherokee, the top couple of hundred feet of Mississippian, the Hunton, the Viola (main objective at present), the St. Peter (probable equivalent of the Simpson of central Kansas and Oklahoma), and the Arbuckle. To date only Hunton and Viola have produced significant amounts of oil in this basin, but some production or shows have been found in each of the others.

Immediately following the discovery of Davis Ranch-Viola field (C on map) by Carter Oil Co. in 1949, the southwestern portion of this basin was the scene of an exciting number of wildcat tests. With the exception of Bushong, a small discovery by Stanolind Oil & Gas Co. about 17 miles south of Davis Ranch, none of the tests found commercial production and interest in the basin waned after 1 year.

The only major companies that have continued to be prominent in the area are Carter and Skelly Oil Co. During the latter part of last year Skelly found two spots of Viola production (Newbury and Mill Creek) and has recently completed a small Kansas City well, all within a few miles north of Davis Ranch. Carter completed one Hunton well in Davis Ranch and has recently completed a Viola well 8 miles southeast of this field.

In the Nebraska area, Richardson County, production has been from the Hunton in four small areas (A on map), all of which were opened in 1939-41. Production from these fields declined rapidly to a total of a few hundred barrels daily. Last year a stepout well to Barada pool opened an extension area which now has over 75 wells and has spread 3 miles to the south. Over 5,000 bbl. of oil daily is being squeezed through Skelly's 4-in. line out of this field. About 20 miles southeast in Nemaha County, Kansas, Carter found the Viola productive at its older Strahm-Hunton pool and completed a Hunton well 4 miles northeast of this field.

Large quantities of water are produced from these northern Hunton wells. Production in the order of only 2 per cent oil for 3,000 bbl. of fluid daily is not uncommon. However, the water is essentially fresh and no disposal problem is presented.

The occurrence of "fresh" water in the porous pre-Pennsylvanian rocks throughout the Forest City basin has led to some interesting speculation on the potentialities of this area. This water is believed to be mostly surface water which has entered these rocks through their bevelled edges along the Nemaha granite ridge to the west and in the northern reaches of the Ozark uplift to the south and east.

If there was much oil generated in the Forest City basin, and all known facts indicate that there should have been, it had to go somewhere as fresh water flushed the porous rocks. The size of Viola structures and accompanying Hunton "buttes" found so far does not indicate sufficient trapping volume to account for very much oil. As it does not appear likely that the oil was flushed from the basin, it is evidently spread thin throughout these rocks or trapped in large volumes in areas yet to be tapped.

The Cherokee sands in the McLouth area (B on map) and in the northwest tip of Missouri are sealed by lateral lithologic variation and local wedgeouts and have not been subjected to flushing. Though it is still a matter of chance to locate these sands, they are only 1,500 ft. deep and should not be overlooked as objectives until the concentration of dry holes in the area to the north of McLouth is much greater than it is now.

Philip C. Ingalls.

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

SOUTH LOUISIANA.—New deep pay has been opened in Burtville field, East Baton Rouge Parish, at Shell Oil Co. 2 V. J. Gianelloni, 50-8s-1e, which flowed 250 bbl. of 42.5°-gravity oil daily through 9/64-in. choke. Production was through perforations at 9,701-06 ft. New pay has also been opened in Chacahoula field, Lafourche Parish, at Sun Oil Co. 2 Levert-Morant Co., 58-15s-15e. Through perforations at 14,145-60 ft., the well is credited with 502 bbl. of 29.1°-gravity oil daily.

ROCKY MOUNTAIN AREA.—California Co. is preparing to deepen through Devonian the wildcat at Upper Valley, Utah, which was completed as a small Mississippian oil discovery almost 2 years ago. J. E. Manning of Cody, recovered salt water on test of a wildcat in Yuma County, Colorado. Shell Oil Co.'s discovery at South Glenrock, Wyoming, flowed 548 bbl. of oil daily through tubing.

WEST TEXAS.—Gulf Oil Corp. 1-H McElroy, Upton County wildcat, recovered 60 ft. of heavily oil-cut mud and 150 ft. of clean oil with no water on a 2-hour test in unidentified lime at 9,135-90 ft. Sinclair 1 McElroy Ranch, Wolfcamp or upper Pennsylvanian prospect 5½ miles southeast of the 1-H test, recovered water blanket and gas-cut mud on a 3-hour test of the Fusselman section at 11,274-309 ft.

NORTH TEXAS.—The Texas Co. 1 Dolly Anderson, extension well in the Sandusky area of Grayson County, completed for 750 bbl. of oil a day, through 16/64-in. choke. Pay zone is the Oil Creek sand between 7,157-82 ft. The completion potential is the highest reported for the field.

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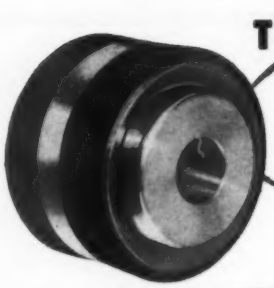
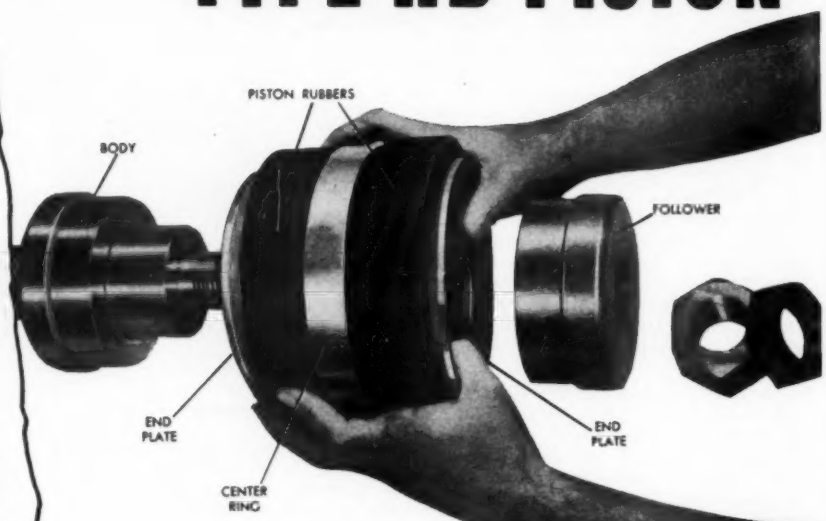
Here's the First Important Pump Piston Development in Years!



THE NEW MacCLATCHIE TYPE HD PISTON



In this new MacClatchie design the piston body STAYS ON THE ROD... replacement time to change piston rubbers is reduced to minutes!

With this new MacClatchie Type HD Piston there's no need to remove the piston rod from the crosshead end of the pump, disassemble the entire piston and replace with a new one. *The body stays on the rod*—you simply remove and replace piston rubbers, saving hours on pump down time.

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To these money-saving features add piston rubbers of new composition and new construction—with exceptional wearing qualities—the answer to economical piston replacement in your pumps.

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Texas Gulf Coast

Fort Bend County Oil Discovery Completed

HOUSTON.—Union Producing Co. 1 Watson, oil discovery located 3 miles south of Katy in Fort Bend County, has been potentialed for 102 bbl. of 41.3°-gravity oil daily through 9/64-in. choke. The well was drilled to total depth of 8,003 ft. and has 7-in. casing at 7,459 ft. Operator plugged back to 7,426 ft. and perforated for production at 6,837-39 ft. with 20 shots. Tubing pressure on the test was 800 psi. and casing pressure 1,675 psi. The new discovery is located in the S. Hobermaker Survey, Abstract 189.

At its confirmation test to the West Fordtran (or Fordtran townsite) discovery, Victoria County, Kirby Petroleum Co. recovered 45 ft. of oil sand in 1 A. R. McGehee-Eva Schwabe unit. The discovery pay, Wilcox, was topped at 8,143 ft. and solid oil sand was logged at 8,143-88 ft. Also, 4½ ft. of oil sand were logged at 8,248-52½ ft., which will likely be cored. This well is located 1,650 ft. north-northwest of Kirby 1 Buchanan discovery oil well, which logged 37 ft. of oil sand at 8,129-66 ft. Both wells are located in I.R.R. Co Survey 7, Abstract 204. It is still undecided if these discoveries will be considered a part of the newly discovered Helen Gohlke Wilcox field, located 2½ miles away.

In the North Willow Slough or Elm's Bayou area of Chambers County, Sun Oil Co. has opened deep pay at its A-1 Connerly. The well was drilled to a depth of 10,314 ft., plugged back and drilled to 9,600 ft. in sidetracked hole. Operator perforated in the Frio zone at 9,520-30 and 9,538-48 ft. for production tests. On potential test, the well flowed 120 bbl. of 34.2°-gravity oil daily through 10/64-in. choke. Tubing pressure was 1,800 psi. and gas-oil ratio was 2,431 to 1. This oiler is located ½ mile southeast of The Texas Co. 1-A Connerly, gas and condensate discovery well. It is in the G. J. Mayes Survey, Abstract 439.

Annava Corp. is preparing to retest its 1 Youens, wildcat located in J. B. McNealy Survey, 1½ miles northeast of Navasota in Grimes County. No details are being released on the wildcat, but it is reported that good sand sections were logged at 9,040-60 ft. and 9,230-50 ft. Well was drilled to total depth of 9,321 ft. and has 7-in. casing cemented at 9,298 ft.

In what is reported to be a new fault block on the west flank of Hankamer field, Liberty County, Gulf Oil Corp. has potentialed its B-1 S. S. Kahn, H&TC RR Co. Survey, Section 21, Abstract 253, for 119 bbl. of 28.5°-gravity oil daily. Flow was gaged through ⅛-in. choke. Tubing pressure was 625 psi. and gas-oil ratio 187 to 1.

New pay has been tapped in the Swan Lake field of Jackson County at The Texas Co. 1 E. C. LaBauve, establishing it as the deepest pay in the field. On a 20-hour production test, the well flowed 104 bbl. of pipe-line oil through 7/64-in. choke. Operator perforated at 8,692-94 ft. for completion. Hole is bottomed at 9,215 ft. and has 5½-in. casing set at 8,773 ft. Tubing pressure on the test was 1,600 psi. This new sander is located ⅛ mile south of Swan Lake field, approximately 1 mile east of the east shore of Swan Lake.

Falcon Seaboard Oil Co. 1 Maude B. Taylor, gas-condensate discovery in Phillip Dimmitt Survey, Abstract 11, Calhoun County, has gaged rich condensate flow from two levels. Through perforations at 8,419-68 ft., the well flowed 13,000,000 cu. ft. of gas per day plus 42 bbl. of condensate per million cubic feet of gas. From perforations at 8,316-22 ft., the well flowed through casing annulus at the rate of 1,500,000 cu. ft. of gas per day plus 82 bbl. of condensate per million. Another possible gas-condensate zone was logged at 8,000-81 ft., but was not tested. Casing was set to 8,520 ft. for completion of the discovery.

TEXAS GULF COAST (DISTRICTS 2 AND 3) SUCCESSFUL WILDCATS

Fort Bend County: Oil discovery—Union Producing Co. 1 Watson, S. Hobermaker Sur., A-189, 3 mi. S of Katy, TD 8,003 ft., perf. 6,837-39 ft., IP: 102 bbl. oil, 964-in. choke, TP800psi.,CP1 . . . . . 9/64-in. choke, TP 800 psi., CP 1,675 psi., 41.3° gravity.

Liberty County: New pay at Hankamer—Gulf Oil Corp. B-1 Kahn et al, H&TC Sur., Sec. 21, A-253, W flank of Hankamer dome, TD 6,530 ft., perf. 5,123-38 ft., IP: 119 bbl. oil, ⅛-in. choke, TP 625 psi., 28° gravity.

TEXAS GULF COAST (DISTRICTS 2 AND 3) WILDCAT FAILURES

Fort Bend County: J. C. Wynne 1 Vallet, H&TC Sec. 83, A-246, 5 mi. SW of Rosenberg, dry, TD 6,529 ft.

Harris County: Humble Oil & Refining Co. 1 Polemanakos, Pierce Sullivan Sur., A-749, dry, TD 8,000 ft.

Jasper County: Hinkle Drilling Co. et al 1 Collins, W. D. Singletary Sur., Sec. 50, A-967, 6 mi. N of Buna, dry, TD 7,815 ft.

Matagorda County: Brazos Oil & Gas Co. 1 State of Texas "X-A" (35911), State tract 195, Matagorda Bay, dry, TD 6,001 ft.

Gulf Oil Corp. A-2 Sanborn, Thos. Williams Sur., A-107, dry, TD 7,015 ft.

Michigan

Dundee Discovery For Ogemaw County

MOUNT PLEASANT.—A new and important Ogemaw County-Dundee oil field was in prospect this week at Basin Oil Co. 1 Winter, NE NE SW 15-21n-1e, Edwards Township, where oil in the Dundee was logged at 3,362-75 ft. Top of Dundee was picked at 3,295 ft. and first indications of oil were showing at 3,346-56 ft. At 3,365 ft. hole carried 600 ft. of free oil in 10 hours. Deepened to 3,375 ft., and after standing 18 hours, well showed 1,500 ft. of free oil. Some water was logged at this depth. On the first day of testing, well swabbed and flowed 112 bbl. of oil in 6 hours. The next day, 60 bbl. of oil and 10 bbl. of salt water were recovered in 6 hours by swabbing. A bottom-hole plastic seal, to shut off water, was run from 3,375 ft. back to 3,371 ft. Well will be pumped natural.

The Ogemaw County wildcat is located about 5 miles southwest of West Branch field and is being tested and produced from a structure which appears to be about 700 ft. lower than the West Branch feature. Acreage around the wildcat is owned by Basin and Socony-Vacuum Oil Co., Inc., with both concerns owning about 2,200 acres. Basin had location cleared for the SW SE NW 14-21n-1e, diagonal northwest 20-acre offset to the 1 Winter, and Socony had a tentative location spotted in the NW NW NE 14-21n-1e, the diagonal southeast offset.

Deepened about 2 ft. in the Dundee, oil flow from I. W. Hartman 1 Cushman, NW SE SE 33-17n-7w, Orient Township, Osceola County, an offset in North Fork field, was boosted from just over 100 bbl. of oil a day to from 40 to 50 bbl. an hour. Dundee top was logged at 3,782 ft. and hole is now bottomed out at about 3,785 ft. This is the best of the three producers out of five

Rube Goldberg Views the News for His Latest Invention

HOW TO KEEP YOUR HAT FROM BLOWING OFF

DARTMOUTH SKI CHAMPION (A) JUMPS OFF CYRANO DE BERGERAC'S NOSE (B) ON THE 38TH PARALLEL (C), THROWING NARRIMAN SADEK (D) INTO ARMS OF KING FAROUK (E)—HE SHAKES OLIVE TREE (F) AND OLIVE (G) FALLS INTO MARTINI COCKTAIL (H), SPLASHING INTO FACE OF TV ACROBAT (I) WHO STAGGERS AND HIGH MAN (J) REACHES FOR ROPE (K), RELEASING DE-BUNKED FLYING SAUCER (L), WHICH LIGHTS UP LATEST U.S. NOTE TO RUSSIA (M)—VISHINSKY (N) TURNS BACK IN SCORN STARTING OUTBOARD MOTOR (O) AND SCREWING HAT ON MAN'S HEAD (P) BY SPECIAL RIDGED HAIRCUT TO KEEP IT ON IN WINDSTORM.

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XUM

wells drilled in North Fork pool. Further offset drilling on the west side of the developed area appeared to be assured.

MICHIGAN WILDCAT FAILURES

Allegan County, Ganges Township: Ford Oil Co. 1 Ritman-Bunyea et al, NW NW SW 21-2n-16w, Ganges Township, Traverse 1,261 ft., dry, TD 1,280 ft.

Missaukee County, Clam Union Township: Gulf Refining Co. 1 Miltner Estate, NE SE SW 2-21n-6w, Dundee 3,888 ft., dry, TD 3,898 ft.

Saginaw County, Bridgeport Township: Chapman Oil Co. 1 Rau, NW NW SE 1-11n-5e, Dundee 2,855 ft., dry, TD 3,075 ft.

South Louisiana

East Baton Rouge Parish Gets New Deep Pay

NEW ORLEANS.—New deep pay has been opened in Burtville field, East Baton Rouge Parish, at Shell Oil Co., Inc., 2 V. J. Gianelloni, 50-8s-1e. Through perforations at 9,701-06 ft., the well flowed 250 bbl. of oil per day plus 237,000 cu. ft. of gas through 9/64-in. choke. Gravity of the oil was 42.5° and tubing pressure was 1,940 psi. Operator drilled the well to a depth of 11,085 ft. and plugged back to 9,868 ft. for completion.

In Chacahoula field, Lafourche Parish, deep pay has been tapped at Sun Oil Co. 2 Levert-Morant Co., 58-15s-15e. Operator drilled the well to a depth of 14,506 ft., cemented 7-in. casing at 13,523 ft., and ran 5-in. liner to total depth. Through perforations at 14,145-60 ft., the well is credited with a flow of 502 bbl. of 29.1°-gravity oil daily, plus 900,000 cu. ft. of gas. Tubing pressure was 5,700 psi., and casing pressure 1,700 psi.

The California Co. has made final completion of its two Lake Coquille wildcats, 1 State Lease 1,785, 20-19s-18e, and 1 State Lease 1,786, 22-19s-18e, Plaquemines Parish. The operator's 1 State Lease 1,785 flowed 159 bbl. of 37.1°-gravity oil daily through perforations at 10,582-94 ft. under tubing pressure of 2,000 psi. Apparently opening deeper pay, 1 State Lease 1,786 is credited with 400 bbl. of 33.9°-gravity oil daily, under tubing pressure of 3,100 psi.

Fidelity Oil & Royalty Co. 1 Edgewood Land & Logging Co., 18-6s-9w, new oil discovery, has been potentialed for 167 bbl. of 43.8°-gravity oil daily through ⅛-in. choke. Tubing pressure was 1,540 psi. and casing pressure 1,610 psi.

Glenmora field of Rapides Parish received another dry hole at Texas Pacific Coal & Oil Co. 1 L. C. Branch et al, Account 1, 26-1s-2w. The well was abandoned at total depth of 11,266 ft. in shale. Slight shows of oil were reported in core at 10,595-645 ft. but recovery was sand with low permeability. This makes the second dry hole for the relatively new field.

SOUTH LOUISIANA SUCCESSFUL WILDCATS

Plaquemines Parish: New oil discovery—The California Co. 1 State Lease 1,785, 20-19s-18e, Lake Coquille, TD 10,624 ft., perf. 10,582-94 ft., IP: 159 bbl. oil per day, 10/64-in. choke, 37.1° gravity, TP 2,000 psi.

New oil discovery—The California Co. 1 State Lease 1,786, 22-19s-18e, Lake Coquille, TD 11,500 ft., perf. 11,394-406 ft., IP: 400 bbl. oil per day, 9/64-in. choke, TP 3,100 psi., 33.9° gravity.

SOUTH LOUISIANA WILDCAT FAILURES

Beauregard Parish: Wheless Drilling Co. and G. S. Hammonds 1 Lutcher-Moore Lumber Co., 33-7s-11w, dry, TD 7,213 ft.

Terrebonne Parish: Phillips Petroleum Co. 1 Continental Fur Co., 14-18s-14e, dry, TD 13,104 ft.

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Oklahoma

Sasakwa Area Wildcat Opens Gilcrease Pool

POWELL-BRISCOE, Inc., has opened another promising producing spot in the Sasakwa area of southeastern Seminole County where its 1 Casey, NW SE SE 24-6n-7e, flowed at an average rate of 10 to 12 bbl. of oil per hour while cleaning out. It flowed 174 bbl. in the first 17 hours. Production is from Gilcrease sand. Total depth is 2,783 ft. with hole open below 2,770 ft.

The location is about ½ mile west of a lone Calvin sand well and more than a mile from any other production. It lies between East Sasakwa and Fish pools and west of production in Northwest Hawkins pool in Hughes County.

The second producing horizon, the Red Fork sand, has been proved in the recently opened Starr Valley pool, northern Payne County. Amerada Petroleum Corp. 1 White, NW NW SE 4-19n-3e, east offset to the discovery well, flowed 60 bbl. of oil and 123 bbl. of water per day from that zone and now is being put on the pump. Total depth is 3,995 ft. with 5½-in. oil string at 3,991 ft. Top of the sand is 3,989 ft. The discovery well, W. H. Elson 1 Hesser, completed last October, produces from Cleveland sand at 3,508-22 ft. It had good showings in drill-stem tests of the Red Fork sand but made considerable water on production tests.

Discovery late last year of the East Shawnee Wilcox sand pool in Pottawatomie County has been confirmed by Phillips Petroleum Co. 1 Rog, NE SE NW 12-10n-4e, south offset to the discovery well. The new well swabbed 155 bbl. of oil in the first 24 hours, and then made 188 bbl. of oil in the next 24-hour period. The Wilcox sand is open at 4,845-73 ft. The pool was opened by Newton Barrett 1 Guderian.

Production of the active and spreading East Spark pool in Lincoln County, has received another westward extension with the testing by Davon Oil Co. of its 13 Newcomer, SW NW NE 8-13n-5e. The well flowed at the rate of 22 bbl. of oil per hour through 38/64-in. choke. Prue sand, the pool's productive horizon, was topped at 3,481 ft. Total depth is 3,605 ft. with casing run through the sand to 3,603 ft. Production is from casing perforations.

Magnolia Petroleum Co. is completing the second good Oil Creek sand producer on the southeast flank of Southwest Mayesville pool, Garvin County. Its 1 Allen-Weatherford unit, NE SW NE 31-4n-2w, flowed 188 bbl. of oil in 6 hours through ¼-in. choke before being shut in for additional tankage. The well, drilled to 8,400 ft., has 7-in. casing to 7,441 ft. with 5-in. liner to bottom. Liner is perforated opposite the Oil Creek sand at 8,325-36 ft. Main production of the pool to date has been from the Deese and Bromide sands.

OKLAHOMA SUCCESSFUL WILDCATS

Garvin County: Kerr-McGee 1 Alta, C SE NW 11-4n-3w, flowed 85 bbl. oil per day from Viola at 7,530-70 ft., TD 8,007 ft., Checkerboard 6,365 ft., first Deese 6,504 ft., second Deese 6,628 ft., Gibson sand 6,742 ft. and 6,764 ft., Hart 6,844 ft., Bois d'Arc 6,880 ft., Sylvan 6,940 ft., Fernvale 7,150 ft., Trenton 7,166 ft., Bromide dense 7,600 ft., first Bromide 7,760 ft., second Bromide 7,820 ft., third Bromide 7,929 ft., new pay in SE New Hope.

Major County: Great Western Producers, Inc. 1 Haskins, NE SW SW 36-22n-10w, flowed 90 bbl. oil per day from Manning at 6,754-6,830 ft., TD 6,865 ft., extension to Ringwood.

Noble County: Dirickson-Lewis Drilling Co. 1 Garrett, SW SW NE 8-22n-1e, pumped 128 bbl. oil per day from Layton at 3,408-20 ft., TD 3,435 ft., Pawhuska 1,922 ft., Elgin 2,215 ft., Endicott 2,460 ft., Oread 2,620 ft., Tonkawa 2,720 ft., no Avant.

Okmulgee County: H. L. Scott 1 Marsh.

BAASH ROSS TOOL CO

Baash-Ross News

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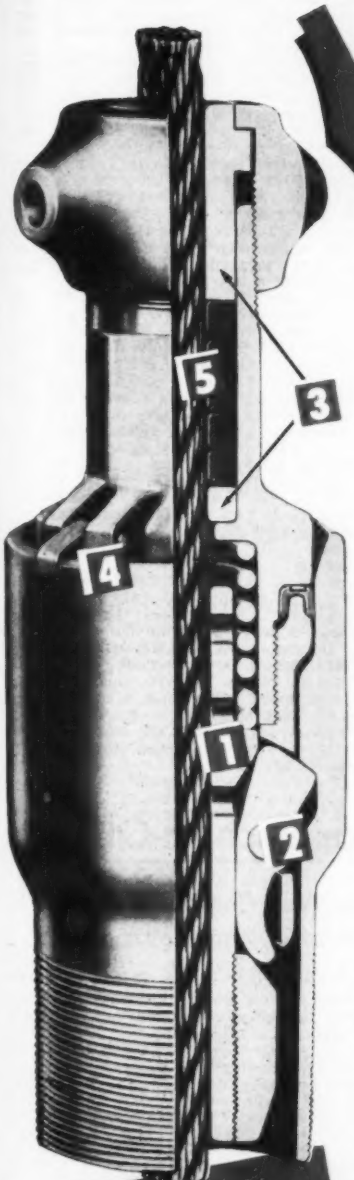

You can get Baash-Ross Wire Line Wipers to fit any size from 2" line pipe to 9" casing...and with interchangeable rubbers and bronze bushings for all line sizes from ½" through 7/8". There's a size to fit practically every wire line operation on all types of rigs.

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2 Note the simplicity and direct action of the release mechanism. The instant it is contacted by the rope socket *it releases*. There are no complicated mechanisms, no delay or inertia to strain a fast-moving line while release is effected. *The Baash-Ross Wiper releases instantly!*

3 Note the bronze inserts *both above and below* the packing rubbers that prevent the steel line from contacting the steel wiper body. No chance here of steel-to-steel sparks touching off gas or oil conditions...a vitally important safety feature!

4 Another feature that's mighty important—there's a foolproof latch that *automatically* locks the pack-off assembly against rotating in the body as the spiral lay of the line is pulled through the Wiper. This keeps the pack-off unit from spinning, reduces wear, increases safety and insures cleaner wiping.

5 And take a particularly close look at the packing unit. It's not just a solid block of rubber, but consists of *many* tough, rubber segments working together and so designed that they provide a *series* of wiping edges against the wire line—not just one edge. This means cleaner wiping.

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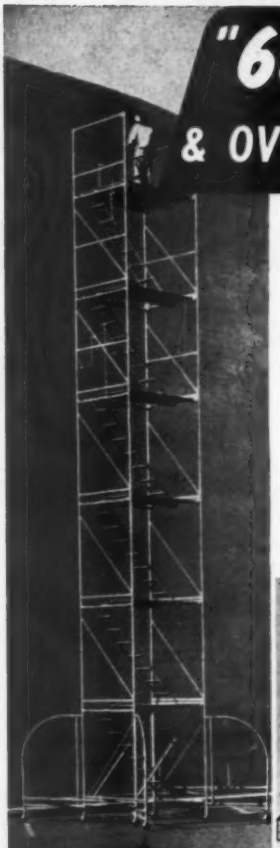

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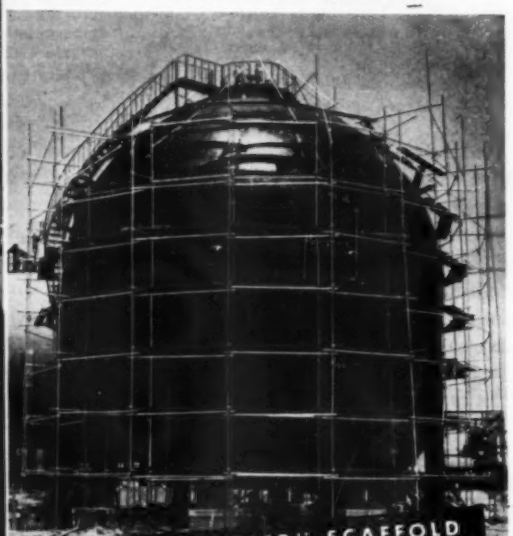

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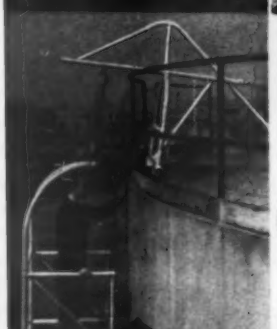

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E½ SW NW 26-16n-14e, pumped 12 bbl. oil per day from second Wilcox at 2,270-2,500 ft., TD 2,528 ft., lime 1,185 ft., sand 1,385 ft., Dutcher 1,710 ft., lime 1,797 ft. and 2,025 ft., Woodford 2,200 ft., Misener 2,270 ft., Burgess 2,495 ft.

OKLAHOMA WILDCAT FAILURES

Creek County: The Texas Co. 1 Wickman, NW SE SW 19-16n-8e, dry, TD 4,200 ft., Oswego 2,453 ft., Prue 2,474 ft., Skinner 2,570 ft., lime 2,775 ft., Red Fork 2,780 ft., Inola 2,968 ft., Bartlesviille 2,975 ft., Mayes 3,372 ft., Misener 3,585 ft., Sylvan 3,627 ft., Viola 3,645 ft., first Wilcox 3,750 ft., Arbuckle 4,090 ft.

Noble County: T. B. Dirickson 1 McGuire, NW NW NE 24-21n-2w, dry, TD 5,334 ft., lower Tonkawa 3,410 ft., Mississippi lime 4,881 ft., Woodford 5,068 ft., Misener 5,120 ft., Sylvan 5,135 ft., first Wilcox 5,218 ft., second Wilcox 5,319 ft.

Osage County: Hanlon-Boyle 1 McKinley, SE SE NE 32-23n-7e, dry, TD 3,086 ft., Layton 1,735 ft., sand 1,770 ft., lime 1,775 ft. and 2,082 ft., sand 2,100 ft. and 2,175 ft., lime 2,195 ft., 2,290 ft., 2,320 ft., and 2,377 ft., broken sand 2,390 ft., Skinner 2,485 ft., Mississippi lime 2,708 ft., Wilcox 2,852 ft., Arbuckle 3,048 ft.

Payne County: Viersen & Cochran Oil Co. 1 Wilson, SW SW NW 17-19n-3e, dry, TD 4,590 ft., Layton 2,752 ft., Checkerboard 3,364 ft., conglomerate sand 3,518 ft., Oswego 3,582 ft., Prue 3,775 ft., Verdigris 3,842 ft., lower Skinner 3,942 ft., lime 3,969 ft., Red Fork 3,988 ft., Bartlesville 4,100 ft., Mississippi lime 4,210 ft., Woodford 4,383 ft., Sylvan 4,428 ft., Viola 4,469 ft., Wilcox 4,509 ft., second Wilcox 4,533 ft.

Pontotoc County: Albert Roskoff 1 Grace, NW SE SW 10-3n-5e, dry, TD 3,451 ft., Woodfard 2,424 ft., Hunton 2,828 ft., Sylvan 2,855 ft., Viola 3,008 ft., Bromide dense 3,315 ft., first Bromide sand 3,408 ft.

Reinhart & Donovan 1 Childress, SE SE NE 14-2n-4e, dry, TD 1,815 ft., broken sand 35 ft., stained sand 120 ft.

Stephens County: Stanolind Oil & Gas Co. 1 Dorrance, SW NE NE 19-2s-4w, dry, TD 7,606 ft., base Permian-top Hoxbar 1,298 ft., Tussy 2,516 ft., sand 2,922 ft., Springer 2,970 ft., limy sand 4,274 ft., shaly sand 4,296 ft., broken limy sand 4,458 ft., Springer 6,270 ft., "A" sand 6,410 ft., "B" limy sand 6,886 ft., "C" sand 7,086 ft.

Appalachian-Ohio

Gas Well Completion for Garrett County, Maryland

PITTSBURGH.—In the Mountain Lake Park section, Garrett County, Maryland, a well has been completed in the chert formation: Eberly & Snee 1 E. O'Donnell, after acidizing, had a final test of 630,000 cu. ft. of gas with rock pressure 1,348 psi. in 48 hours, chert 3,280 ft., total depth 3,522 ft. Three new operations were noted: Columbian Carbon Co. is grading road at 1 D. E. Offutt; Smith Drilling Co. is moving in at 1 Joe Welch; and New York State Natural Gas Corp. has located 1 Orville Kitzmiller.

In Bethel Township, Armstrong County, Southwest Pennsylvania, Iseman Bros. & Woodside completed a good shallow sand well, 2 S. Wareham, gaging 1,104,000 cu. ft. of gas, total depth 2,036 ft.

Two new locations in Southwest Pennsylvania were reported during the past week: Allegheny and Loyalhanna townships, Westmoreland County.

A good shallow sand gas well was completed in Union district, Jackson County, West Virginia: Blair Amick 1 W. W. Friend et al, gaging 1,391,000 cu. ft. of gas, after shot, in the Brown shale, total depth 3,641 ft. In deep wildcat drilling in West Virginia: Steele district, Wood County, Godfrey L. Cabot, Inc., 1-1345 Sarah E. Singledecker is drilling at 312 ft.; Portland

district, Preston County, Eberly & Snee 1 S. F. Calvert is running casing at 5,212 ft.; Beaver Pond district, Mercer County, United Fuel Gas Co. 1-6478 A. W. Hicks is drilling at 5,290 ft.

MARYLAND SUCCESSFUL WILDCAT

Garrett County: Eberly & Snee 1 E. O'Donnell, 630,000 cu. ft. of gas after acidizing, rock pressure 1,348 psi. in 48 hours, chert 3,280 ft., gas in this formation, TD 3,522 ft.

OHIO

COLUMBUS.—Fairfield Drilling Co. finished a successful fishing job on the 1 C. E. Johnson, Section 2, Reading Township, Perry County. The Clinton was logged at 3,031-64 ft. with 10 bbl. of oil and 200,000 cu. ft. of gas, natural, and 135 bbl. of oil and 250,000 cu. ft. of gas after a 90-qt. shot. In Hopewell Township, Mid East Oil Co. 1 Leo Clouse, Section 28, came in at 100,000 cu. ft. of gas, natural, with sand at 2,983-3,013 ft. The well responded well to a 100-qt. shot and gaged 750,000 cu. ft. of gas 1 hour after treatment.

W. C. Adair & Co. 1 John Sweazy, Section 36, Falls Gore Township, Hocking County, made 15 bbl. of oil, natural, and flowed 15 bbl. in 3 hours after shot.

Clinton Oil Co. will attempt to extend New Castle pool ⅝ mile to the southwest with a location on Walter Speckman, Section 4, Perry Township, Coshocton County.

North Central Texas

Long Palo Pinto Extension For North Knox City Field

WICHITA FALLS.—Development work at the new North Knox City Palo Pinto field, southern Knox County, was off to a good start with one long extension reported flowing oil.

Stanolind Oil & Gas Co. 1 Verhallen, ½ mile southwest of the discovery, flowed 124 bbl. of oil and 4 bbl. of water in 24 hours, through 13/64-in. choke from perforations in the Palo Pinto at 4,248-58 ft. Stanolind's 1 Mable Wilson, southeast offset, was dry in the Palo Pinto, having recovered 60 ft. of drilling mud and 150 ft. of muddy salt water on a 1-hour test from 5,851-5,900 ft. Operators were to drill ahead to the Ellenburger.

In the same area, Stanolind's 1 Travis was drilling lime at 2,448 ft. at last report, and the 1 Bowden, northeast of Knox City in Block 12, Burnett Survey, was drilling ahead after setting surface casing.

Warren Oil Corp. completed a good Strawn well and confirmation test to a discovery in north-central Young County. The well is 1-B B. W. King, 2½ miles west of Jean, which pumped 150 bbl. of 42°-gravity oil, plus some water, from pay at 3,120-36 ft. A west offset to the discovery was drilled into the Mississippian to 5,075 ft., then plugged back to 3,136 ft. for testing. It logged the Caddo at 4,016 ft. and the deeper limestone formation at 4,946 ft.

In Montague County Ralph Myers Contracting Corp. 1 Woods, in the Wells Survey, extended production ½ mile north on the west side of Rogers & Rogers field. On completion test the well pumped 82 bbl. of 42°-gravity oil a day from pay at 4,490-4,500 ft. The same operators were drilling an east offset to the discovery.

Moutray-Moore Drilling Co. 1 J. L. Sharp, Fisher County wildcat west of the Royston field, set casing on bottom at 3,841 ft. for completion try as a Swastika discovery. A 35-minute drill-stem test from 3,822-36 ft. had gas in 2½ minutes and oil in 15 minutes. Recovery or flow, if any, was not reported. Top of the formation was 3,810 ft.

A gas discovery for Hamilton County, 4 miles west of the town of Hamilton, was in prospect at Amerada Petroleum Corp. 1 McEntire. A test through perforations at 3,195-3,285 ft., identified as the Marble Falls, flowed gas at the rate of 1,200,000 cu. ft. daily through ¾-in. choke. Testing was to continue through various size chokes.

In Throckmorton County, Cities Service Oil Co. has made steady progress in developing production on its SMS ranch. Latest test to report shows of oil is the 1-120 SMS ranch, Block 120, BBB&C Survey. A 1-hour drill-stem test of the lower Palo Pinto from 3,398-3,406 ft. recovered 180 ft. of gas, 30 ft. of oil-cut mud and 280 ft. of sulfur water. Operators were drilling ahead below 3,504 ft.

Southeast of Henrietta in Clay County, Stephens Petroleum Co. 1 Bryant Edwards, Simpson limestone discovery, developed a flow of 4 bbl. of oil an hour from casing perforations at 6,227-51 ft., and later gaged 85.4 bbl. of oil in 16 hours through 24/64-in. choke, Flowing pressure on tubing was 80 psi.

Pure Oil Co. 1 Triplett, Mills County wildcat, 4 miles southeast of Zephyr, topped the Marble Falls lime at 1,785 ft., minus 302 ft., and reported samples with slight oil shows and porosity. A drill-stem test was in progress to 1,806 ft.

NORTH CENTRAL TEXAS (DISTRICTS 9 & 7-B) SUCCESSFUL WILDCATS

Fisher County: Intex Oil Co. 1 A. Gerald, 174-2-H&TC, TD 6,478 ft., elev. 1,912 ft., Noodle Creek 3,381 ft., pay 3,429-34 ft., pumped 64 bbl., 38°-gravity oil a day.

Texas Pacific Coal & Oil Co. 1-A Robertson, 185-1-BBB&C, TD 6,235 ft., elev. 1,771 ft., Swastika 3,690 ft., perf. 3,691-94 ft., pumped 47 bbl. 43°-gravity oil a day, plus water.

Parker County: Kingwood Oil Co. 1 Leudtke-Williams, T&P Sur. 69, 2 mi. NW Springtown, TD 3,985 ft., pay 3,862 ft., pumped 132 bbl. oil a day.

Taylor County: Drilling & Exploration Co., Inc. 2-A Tipton, 9-18-T&P, 1 mi. S Merkel, TD 2,670 ft., Flippen 2,660 ft., pumped 54 bbl. 37°-gravity oil a day.

NORTH CENTRAL TEXAS (DISTRICTS 9 & 7-B) WILDCAT FAILURES

Archer County: T. M. Weathered 1 G. M. Folsom, E. G. Knight Sur., 10 mi. W Wichita Falls, dry, TD 609 ft.

Baylor County: Anderson-Prichard et al 1 Claude Cowan, T&NO Sur., 2 mi. SW Fulda, dry, TD 5,170 ft.

Anderson-Prichard et al 2 Claude Cowan, T&NO Sur., 2 mi. S Fulda, dry, TD 5,170 ft., Caddo 5,110 ft.

Brown County: Lorenna Ball Busbee 1 Jenkens, Comanche CSL, 5½ mi. SE May, dry, TD 1,103 ft.

Clay County: L. T. Burns 2-A Frank Bunting, Orange CSL, 3½ mi. SW Henrietta, dry, TD 4,451 ft.

Coleman County: Haynes B. Ownby et al 1 W. L. Stone, H. M. Childress Sur., 2 mi. SW Glen Cove, dry, TD 3,738 ft., elev. 2,079 ft., Swastika 2,235 ft., Capps 3,375 ft., Fry 3,405 ft., lower Capps 3,455 ft., lower Fry 3,465 ft.

G. F. Lebus, Jr., & Roy Lebus 2 A. E. Jones, Sec. 16, T&NO, 4 mi. SW Novice, dry, TD 3,262 ft.

J. R. Rich 1 A. L. Wilkenson, N. B. Waters Sur., 2 mi. NE Coleman, dry, TD 2,424 ft., Canyon 1,360 ft., Strawn 2,040 ft.

Comanche County: Frank Wills 1 R. J. Scott, 26-2-H&TC, 7½ mi. N Baltie, dry, TD 3,040 ft., Ellenburger 2,935 ft.

Cooke County: T. B. Frost 1 Danglemayr, L. C. Gibbs Sur., 10 mi. N Muenster, dry, TD 2,262 ft.

Eastland County: Woodley Petroleum Co. 1 G. P. Fee "M," 59-4-H&TC, 2½ mi. NE Cisco, dry, TD 3,810 ft., elev. 1,561 ft., Caddo 3,155 ft., Lake 3,376 ft., upper Ranger 3,615 ft.

Jones County: Sojourner Drilling Co. 2 J. L. Crow, J. H. Gibson Sur., 10 mi. W. Anson, dry, TD 3,410 ft.

Palo Pinto County: Ned B. Hoffman 1 Mrs. H. H. Johnson, B. McNelly Sur., 6 mi. W Graford, dry, TD 1,800 ft. in shale.

Zenith Petroleum Corp. 1 Mrs. H. H. Johnson, W. H. Lewis Sur., 5 mi. N Graford, dry, TD 1,775 ft., show of gas 1,162 ft.

Shackelford County: D. S. Gearhart 1 F. G.

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Trinity Production Co. 1 G. R. Davis, 67-13-T&P, 5 mi. E Hamby, dry, TD 1,940 ft.

Stephens County: Alec J. Saba 1 C. M. Sullivan, Sec. 2095, TE&L Sur., 8 mi. SE Breckenridge, dry, TD 2,300 ft.

Wichita County: Karl W. Mulligan 1 Sherrod, Blk. 2, Lge. 4, 7 mi. W Wichita Falls, dry, TD 746 ft.

Young County: P. C. Brashear 4 Finch, TE&L Sur., 4 mi. SW Orth, dry, TD 775 ft.

A. R. Dillard 1 Frank Lofton, L. W. Ross Sur., 5 mi. N Loving, dry, TD 3,702 ft.

Henry Grace 1 G. R. Lemmond "B," BBB&C Sur., 18 mi. SE Archer City, dry, TD 3,711 ft.

Mississippi

Well West of Tinsley Will Core Top of Smackover

JACKSON.—On the west side of Tinsley field, Yazoo County, Union Producing Co., Jones-O'Brien 1 Logan, 23-10n-3w, had top of Buckner called at 12,500 ft. (—12,250 ft.). Structurally this point is approximately 1,850 ft. lower than in Union 21 Stevens located in Section 12 of same township. Operators are changing to oil emulsion mud and will core for top of Smackover.

In the Thompson Creek area of southwestern Wayne County, Tip Ray-I. P. LaRue, Jr., 1 Gaines Sanderson, wildcat, 31-7n-8w, has been abandoned at total depth of 8,326 ft. in the Lower Cretaceous. No shows were encountered in the well. This is the fourth dry hole to be drilled on the prospect. However, it is interesting to note that all of the tests drilled encountered approximately 125 ft. of practically solid sand with good porosity in the Stanley zone of the Eutaw.

In Madison County, Continental Oil Co. 1 John R. Cameron et al, 36-10n-1e, wildcat, is drilling below 12,530 ft. in quest of the Smackover. Top of the Cotton Valley was picked at 11,070. Small gas shows have been logged in the well, the latest being at 12,-208-16 ft.

Permit has been secured for a deep Washington County wildcat by C. H. Murphy & Co. The well, 1 Treadway, 20-15n-6w will seek productive sands to 8,000 ft. Proposed depth of the test is believed to make a thorough test of the Lower Cretaceous and possibly may reach the Smackever. This operation is a joint venture of C. H. Murphy & Co. and Sun Oil Co. with Murphy acting as operator.

MISSISSIPPI WILDCAT FAILURE

Wayne County: Tip Ray-I. P. LaRue, Jr., 1 Gaines Sanderson, 31-7n-8w, dry, TD 8,324 ft.

Kansas

Phillips County Wildcat Makes Lansing Producer

HONAKER DRILLING CO. appears to have opened another pool in northern Phillips County, where its 1 Kent, NE SE SE 22-1-18, produced at the rate of 4 bbl. of oil per hour in final swabbing tests. Pumping equipment now is being set up for completion and potential tests.

Production is from the Lansing section, topped at 3,337 ft. (—1,180 ft.) and drilled to 3,505 ft. Casing, cemented 1 ft. off bottom, is perforated at 3,484-92 ft. The interval was treated with 4,000 gal. of acid prior to testing. The location is approximately 2 miles northeast of Huffstutter pool.

Testing also is under way at another Phillips County wildcat located about 4½ miles east of the Honaker well in SW SW SW 21-1-17. It is Westgate-Greenland Oil Co. and Bay Petroleum Corp. 1 Rolland, which bailed an average of 1 bbl. of oil per hour from casing perforations at 3,597-3,605 ft. in the Lansing. Additional perforations higher in the section will be made for further tests. Top of the Lansing is given at 3,502 ft. (—1,301 ft.). Bottom of the casing is 3,757 ft. with total depth of the hole at 3,758 ft. This prospective well is only 4 miles south of the Nebraska line.

B & R Drilling Co. 1 Johnson, SW SW SW 27-19-12, which is opening another pool in the Ellinwood area of Barton County, is being put on the pump following swabbing tests in which it made an average of about 6 bbl. of oil per hour. Its production is from Arbuckle lime, topped at 3,362 ft. (—1,549 ft.). Total depth is 3,371 ft. The well is about a mile west of the Hammer pool, nearest other production.

About 2 miles to the northeast in NW NW SE 24-19-12, also in Barton County, W. L. Hartman 1 Robl swabbed an average of 1 bbl. of oil per hour in testing the Arbuckle, topped at 3,353 ft. (—1,546 ft.). Total depth is 3,413 ft. with hole open below 3,354 ft. It is a mile north of the recently opened Werner pool and about the same distance east of North Hammer pool. The well also had promising showings in the Lansing-Kansas City section, which will be tested later.

Heathman Drilling Co. 1 Bassett, SW SW SE 20-10-20, 1½ miles east of the Laura pool and 2 miles southwest of the Marcotte pool, in southwestern Rooks County, got 20 ft. of clean oil and 55 ft. of oil-cut mud in 30-minute drill-stem test in Arbuckle lime at 3,749-57 ft. Top of the Arbuckle is 3,747 ft. (—1,581 ft.). Casing has been run to bottom at 3,757 ft. and will be perforated for completion.

KANSAS SUCCESSFUL WILDCATS

Barton County: Ash & Smith 1 Musenberg "B," SE SE NW 10-19s-11w, pumped 396 bbl. oil per day from Lansing at 3,224-30 ft., TD 3,367 ft., Topeka 2,646 ft., Heebner 2,915 ft., lime 3,035 ft., Arbuckle 3,337 ft.

Ellis County: The Texas Co. 1 Reidel, SW NE SE 31-13s-19w, pumped 188 bbl. oil per day from Arbuckle at 3,905-10 ft., TD, Topeka 3,268 ft., Heebner 3,525 ft., Lansing-Kansas City 3,567 ft., Sooy 3,863 ft.

Stafford County: Hawley 1 Knoche "A," NE NE NE 8-24s-12w, 7,200,000 cu. ft. gas per day from Viola at 3,810-20 ft., TD 4,037 ft., Heebner 3,290 ft., lime 3,438 ft., Lansing-Kansas City 3,463 ft.,

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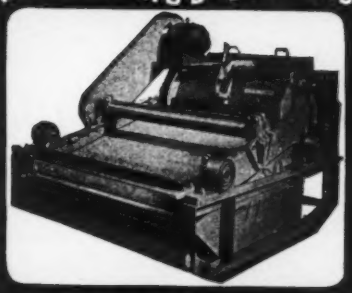

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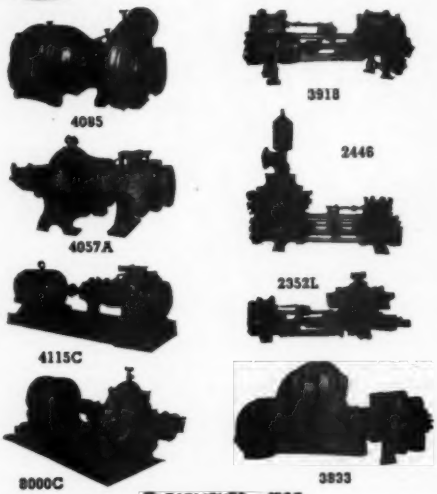

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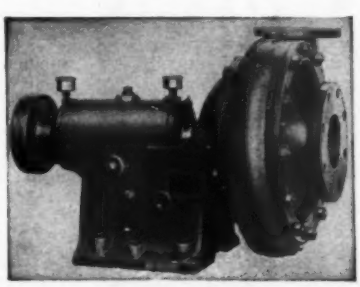

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KANSAS WILDCAT FAILURES

Barber County: Aurora 1 Gillespie, SW SW NW 22-32s-12w, dry, TD 4,865 ft., Heebner 3,580 ft., Douglas sand 2,723 ft., Mississippi lime 4,349 ft., Kinderhook 4,509 ft., Misener 4,614 ft., Viola 4,616 ft., Arbuckle 4,810 ft.

Barton County: Kantor 1 Eveleigh, SE SE SE 2-18s-13w, dryl, TD 3,356 ft., Heebner 2,988 ft., lime 3,082 ft., Sooy 3,343 ft., Arbuckle 3,345 ft.

Anschutz 1 Tuggle, SE SE SW 30-20s-14w, dry, TD 3,720 ft., anhydrite 880 ft., Heebner 3,229 ft., lime 3,330 ft., Lansing-Kansas City 3,343 ft., Sooy 3,587 ft., Simpson 3,650 ft., Arbuckle 3,667 ft.

Butler County: Wixson et al 1 Edmiston, NW SW SW 33-25s-4e, dry, TD 2,737 ft., Mississippi chat 2,477 ft., Mississippi lime 2,531 ft.

Ellis County: Pickrell 1 Polcyn, SW NW SW 12-13s-16w, dry, TD 3,425 ft., anhydrite 1,045 ft., Topeka 2,872 ft., Heebner 3,089 ft., Dodge 3,096 ft., Lansing-Kansas City 3,140 ft., Arbuckle 3,417 ft.

Harvey County: Carlock 1 Walton, SE NE NE 19-23s-2e, dry, TD 3,652 ft., Lansing 2,306 ft., Kansas City 2,506 ft., Sooy 2,929 ft., Sooy sand 2,941 ft., Mississippi chert 2,991 ft., Kinderhook 3,241 ft., Hunton 3,352 ft., Maquoketa 3,420 ft., Viola 3,444 ft., Simpson dolomite 3,471 ft., Simpson sand 3,488 ft., Arbuckle 3,552 ft.

Marion County: Murfin et al 1 Miller, NE NW NE 23-22s-4e, dry, TD 2,620 ft., Kansas City 1,875 ft., Mississippi chert 2,450 ft., cherty Sooy 2,475 ft., Kinderhook 2,500 ft., Viola (?) 2,612 ft.

Phillips County: Alpine 1 Seyler, SW SW NW 9-1s-18w, dry, TD 3,489 ft., Heebner 3,288 ft., Lansing-Kansas City 3,315 ft.

Pratt County: Hartman 1 Gaty, SE NE NW 24-26s-12w, dry, TD 4,318 ft., Heebner 3,408 ft., Lansing-Kansas City 3,604 ft., Viola 4,126 ft., Simpson 4,220 ft., Simpson sand 4,232 ft., Arbuckle 4,300 ft.

Rawlins County: Loar-Stearns 1 Burton, CSL SW SW 18-3s-34w, dry, TD 4,295 ft., base Niobrara 1,420 ft., Dakota 1,820 ft., Lakota 2,230 ft., Morrison 2,400 ft., Day Creek 2,538 ft., Blaine 2,655 ft., anhydrite 2,890 ft., Topeka 2,929 ft., Lansing-Kansas City 4,091 ft.

Reno County: Wakefield 1 Sigg, NW NW SE 26-26s-4w, dry, TD 3,793 ft., Lansing-Kansas City 2,898 ft., Mississippian 3,716 ft.

Rice County: Strat test—Continental Oil Co. 1 Habiger, NE NE NW 24-18s-7w, dry, TD 3,515 ft., Lansing-Kansas City 2,732 ft., Sooy 3,154 ft., Kinderhook 3,178 ft., Misener 3,232 ft., Maquoketa 3,294 ft., Viola 3,352 ft., Simpson 3,400 ft., Arbuckle 3,458 ft.

Flynn 1 Plank, SE NW SW 16-19s-8w, dry, TD 3,526 ft., Topeka 2,410 ft., lime 2,865 ft., Lansing-Kansas City 2,895 ft., basal Kansas City 3,552 ft., sandy Sooy 3,319 ft., Viola 3,382 ft., Simpson shale 3,437 ft., Simpson sand 3,446 ft., Arbuckle 3,496 ft.

Stafford County: Petroleum, Inc. 2 Matzek, CNL S½ SW 35-21s-14w, dry, TD 3,430 ft., anhydrite 830 ft., Heebner 3,296 ft., Toronto 3,319 ft., base Oread 3,396 ft., lime 3,420 ft., Lansing-Kansas City 3,429 ft.

Wabaunsee County: Honaker et al 1 Mathies, NE SW SW 15-12s-10e, dry, TD 3,049 ft., Lansing 1,242 ft., Lansing-Kansas City 1,374 ft., Mississippi chert 2,225 ft., Mississippi dolomite 2,246 ft., Kinderhook 2,509 ft., Hunton 2,713 ft., Maquoketa 2,954 ft., Viola 3,027 ft.

Skelly 1 Wolgast, SE NE SW 18-12s-11e, dry, TD 3,168 ft., Howard 728 ft., Topeka 791 ft., Lansing 1,370 ft., Kansas City 1,507 ft., Mississippi lime 2,383 ft., Kinderhook (?) 2,669 ft., Hunton 2,842 ft., Viola 3,166 ft.

Eastern Texas

Crude for Woodlawn Gas-Distillate Area

DALLAS.—The Woodlawn gas-distillate area of Harrison County had prospects of crude oil production from the Pettit limestone. The discovery, or long extension is Hollandsworth Oil Co. 2 Frank Davis Estate, located on the west flank of the producing area, and 2 miles south of the same firm's 1 Davis, wet-gas producer and first well on its 3,000-acre lease. According to reports, the 2 Davis flowed crude oil at the rate of 100 bbl. an hour through ⅜-in. choke on tubing, for a period of 3 hours, from perforations at 6,410-20 ft.

A long north stepout test has been scheduled for the Woodbine area of southeast Anderson County. D. A. McCrary of Calvert, will drill the 1 Southern Pine Lumber Co. as a 5,400-ft. test on a 705-acre lease in the T. N. Jones Survey. It will be the first activity in the area since Ed Howard and others drilled the 1 Clewis, A. Hendley Survey, as a Woodbine discovery at 5,286-90 ft.

Continental Oil Co. 1 Carroll, prospective gas-distillate discovery southeast of Tennessee Colony, cored limestone with some oil stains at 8,850-8,900 ft. and was coring ahead below 8,920 ft. looking for the Travis Peak. The well recovered 300 ft. of distillate on a drill-stem test in the Rodessa at 8,810-50 ft.

In Grayson County, Sinclair Oil & Gas Co. has abandoned its 1 Jewell, wildcat test about 3 miles west of the Ellenburger discovery of Sandusky field. Total depth was 8,190 ft. The well had made several shows for production from the Ellenburger.

Olson Drilling Co. 1 Little, Walker Survey, topped the Oil Creek at 7,172 ft. and drilled sand with oil shows to 7,175 ft. A test of the section developed a flow of 28 bbl. of oil an hour and recovered 1,080 ft. of clean, 50°-gravity oil. Flowing pressure

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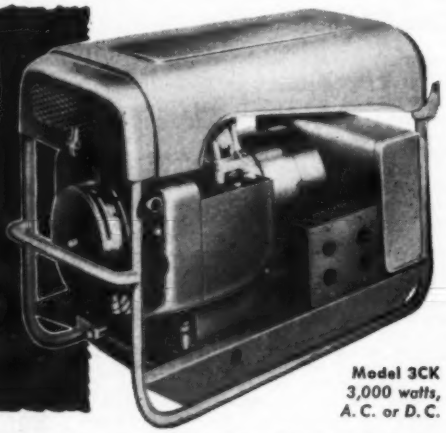

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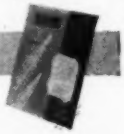

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ranged from 2,100-25 psi. and 30-minute bottom-hole pressure was 3,350 psi. Time on the test was not reported.

EAST TEXAS (DISTRICTS 5 & 6) WILDCAT FAILURES

Angelina County: Goodwin Oil Co. 1 G. Davis, J. H. Graham Sur., 8 mi. SE Zavala, dry, TD 1,250 ft.

Falls County: Bell Petroleum Co. 1 Leo Welch, A. F. James Sur., 1 mi. N Durango, dry, TD 1,112 ft., Buda 1,087 ft. R. D. Hawn and Cecil Mills 1 Ernest King, N. K. Robinson Sur., 2½ mi. SW Lott, dry, TD 1,569 ft., Buda 1,320 ft., Edwards 1,520 ft.

Grayson County: Pure Oil Co. 1 O. B. Rich, R. H. Admstrong Sur., 1½ mi. N Sandusky, dry, TD 8,280 ft., Simpson 7,645 ft., Oil Creek approximately 8,230 ft.

Kaufman County: Humble Oil & Refining Co. 1 Roy N. Moody, George Hider Sur., 5 mi. N Elmo, dry, TD 7,473 ft., Paluxy 5,765 ft., Massive anhydrate 6,445-6,575 ft.

Marion County: Edmonds, Hill & Bryson 1 G. W. Gray, M. J. Nall Sur., 6 mi. SE Smithland, dry, TD 2,995 ft.

Rains County: Garvin Oil Co. 1 L. C. Harrison, M. Tollett Sur., 5½ miles SW Point, dry, TD 5,312 ft.

Smith County: Ryan Consolidated Petroleum Co. 2 D. S. Wright, J. M. Garcia Sur., 3 mi. SW Crow, dry, TD 4,810 ft., Nacatoch 2,320 ft., Pecan Gap 3,110 ft., Austin 4,810 ft.

California

More Wildcats for Castaic Junction Area

LOS ANGELES. — Two more locations have been added to the group of wildcats seeking deep production in the vicinity of Castaic Junction, about 35 miles northwest of Los Angeles. At the weekend five other tests were under way within 7 miles of the junction.

The two new wildcats were staked by Humble Oil & Refining Co. and General Exploration Co. The former, its No. 1-D Newhall Land and Farming Co. in 9-4n-16w, has been located about 2½ miles southeast of Honor Rancho field, a last year's discovery. General Exploration's test, drilled on a 50-50 basis with Union Oil Co., was staked in 29-4n-16w, or about 2 miles southeast of the Castaic Junction field. The wildcat, its No. 1 Newhall Land, is slated to drill to 12,000 ft.

Humble's ¼-mile east extension attempt to Castaic Junction, located in Section 19, at the weekend was coring below 10,423 ft. Chances for it making a well in a shallower sand were believed to be good. The same company's B-1 Newhall Land in Section 12, midway between Castaic Junction and Honor Rancho, was drilling in a Mohnian shale below 11,050 ft. It had not encountered any favorable showings above that depth. Further north, in Section 1, the company's ½-mile west stepout to Honor Rancho was drilling below 9,000 ft. It tested wet in both sands from which Honor Rancho production is obtained.

In Monterey County, Jergins Oil Co.'s wildcat 1 mile southwest of Los Lobos field was drilling below 3,900 ft., following a drill-stem test at 3,480-3,520 ft. After the tool had been open for 1½ hour, the 600 ft. of fluid showed 455 ft. was 13°-gravity crude and 145 ft. oily, muddy water. The wildcat is the Jergins No. 1 Aurignac.

About 2 miles east of Gill Ranch field in Fresno County, Honolulu Oil Corp. has started its 1 Ponte in 24-13s-16e. The wildcat is about 1 mile northwest of a 8,789-ft. dry hole drilled by Richfield Oil Corp. in 1942. It found a slight oil show in the

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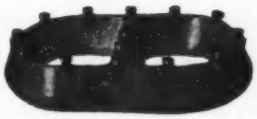

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In the Los Angeles Basin region, developments included the staking of a northeast offset to the Doheny discovery south of Anaheim in Orange County. The stepout will be Sunray Oil Corp. 1 Foiles.

About 1 mile northeast of Huntington Beach production, Sunview Oil Co. was below 4,700 ft. at its 1 Sunset Heights. On a 2-hour formation test at 4,650-4,700 ft. the wildcat yielded 3,000 ft. of fluid, the top 600 ft. of which consisted of gas and oil-cut mud. The test, located in 29-5s-11w, reportedly topped the middle Pico at 1,280 ft., the lower Pico at 3,130 ft., and the Repetto at 3,560 ft.

CALIFORNIA UNSUCCESSFUL WILDCATS

Kern County, Devils Den area: Bailey Balken 1 Devils Den Dev. Co., 23-25s-18e, dry, TD 1,324 ft., elev. 738 ft.

Southeast Edison area: Rex Oil Co. 1-A Rex Tejon, 23-30s-30e, dry, TD 1,015 ft., elev. 1,455 ft.

Southeast Edison area: San Joaquin Drlg. Co. 3 DiGiorgio, 31-30s-30e, dry, TD 541 ft., elev. 626 ft.

Los Angeles County, Sand Canyon area: Sandee Oil Co. 1 Brooks, 2-3n-15w, dry, deepened from 2,672 ft., TD 4,305 ft., elev. 2,190 ft.

Monterey County, Cholame area: British American Oil Producing Co. 26A Cholame, 12-24s-15e, dry, TD 2,253 ft., elev. 1,562 ft.

San Luis Obispo County, Templeton area: Gene Reid Drlg. Co. 1 Aqueda, 32-27s-12e, dry, TD 1,578 ft.

San Bernardino County, Chino Hills area: L. H. Cameron 3 M, 5-3s-8w, dry, TD 1,613 ft., elev. 1,131 ft.

Ventura County, Calabasas area: Terminal Drlg. Co. 1 Barrett-Crummer, 4-1n-17w, dry, TD 1,005 ft., elev. 1,055 ft.

Southwest Texas

Starr County Wildcat Flows on Test

CORPUS CHRISTI.—Two miles southeast of Jones field, Starr County, Sun Oil Co. 10 A. C. Jones, wildcat, Agua Neuva de Abajo grant, flowed 65 bbl. of oil daily and 5 bbl. of wash water on initial test. Operator drilled the venture to total depth of 4,695 ft. and set 5½-in. oil string at 4,650 ft. The well was perforated at 4,576-622 ft. for testing. After running tubing the well cleaned into tanks and then died. Operator then swabbed and the well again started flowing.

At its Dagger Island wildcat, Atlantic Refining Co. 1 State tract 341, Red Fish Bay, Nueces County, tested 2,616,000 cu. ft. of gas per day plus 4 bbl. of condensate on initial test. Operator drilled the well to a depth of 9,503 ft., and plugged back to 8,782 ft. for testing. First test was made through perforations at 8,610-20 ft. When tool was pulled, recovery was 100 ft. of condensate and 120 ft. of drilling mud. Perforations were squeezed and well was plugged back to 8,561 ft. Operator is currently preparing to reperforate the well.

The same operator's 1 Jan S. Womack, wildcat in Cuadrilla Irrigation Co. Survey, Abstract 465, Nueces County, is at total depth of 9,997 ft. and now testing. Latest test on the well was run at 8,775-86 ft., using ¼-in. chokes. It flowed at the rate of 414,000 cu. ft. of gas per day plus 21 bbl. of fluid, being 45 per cent salt water and 55 per cent condensate.

R. J. Caraway 1 Guida Rose, deep wildcat test in Val Verde County, topped the Strawn lime at 9,888 ft. Testing operations have been delayed because of gas in the mud which kept kicking back. Mud weight was changed and operator is reported to be running drill-stem test. The Strawn is a solid limestone in this well and not reef.

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The wildcat is located in GC&SF Survey 2, 24 miles south of Sonora.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) SUCCESSFUL WILDCAT

Starr County: Oil discovery "Leary-Wood" —O. N. Leary, trust, 1 D. G. Wood, Porcion 84, 4 mi. E of Rio Grande City, TD 1,837 ft., perf. 1,654-58 ft., IP: 84 bbl. oil on pump, 26° gravity.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) WILDCAT FAILURES

Duval County: Argo Oil Corp. B-1 Leroy Denman estate, Tract 2, Sec. 13, Realitos Subd., Copita Farm and Garden tracts, 5 mi. S-SW of Realitos, dry, TD 6,557 ft.

F. William Carr 1 P. McBride, J. M. Ynojosa Grant, A-628, 2 mi. SE of Realitos, dry, TD 5,500 ft.

Tiger Minerals, Inc. A-2 Lucille Gruy estate, J. Poitevent Sur. 393, A-483, dry, TD 1,841 ft.

Hidalgo County: Continental Oil Co. 1 Mary O'Brien Shary, Lot 29-3, Bellwoods Subd., Porcion 54, 2 mi. N of Mission, dry, TD 9,010 ft.

Jim Hogg County: Southern Minerals Corp. 1 Silver Lake ranch, Diego Hinojosa Sur., 1 mi. NE of Hebbronville, dry, TD 4,208 ft.

McMullen County: R. H. Hedge and J. C. Wynn 1 H. M. Roark, James B. Taylor Sur. 62, A-632, 2 mi. SE of Green Franklin field, dry, TD 6,500 ft.

San Patricio County: Superior Oil Co. 1 M. S. Welder, Sec. 5, Welder Ranch Subd., 3 mi. NE of Sinton, dry, TD 9,300 ft.

Zapata County: Charles H. Andrus 1 Evanista Gutierrez, Block 3, Murt C. Cullinan Sub. of Share 2, Las Comitas Grant, dry, TD 2,504 ft.

The Chicago Corp. 1 Lydia Graf, HE&WT RR Sur. 217, 23 mi. E of Zapata, dry, TD 5,505 ft.

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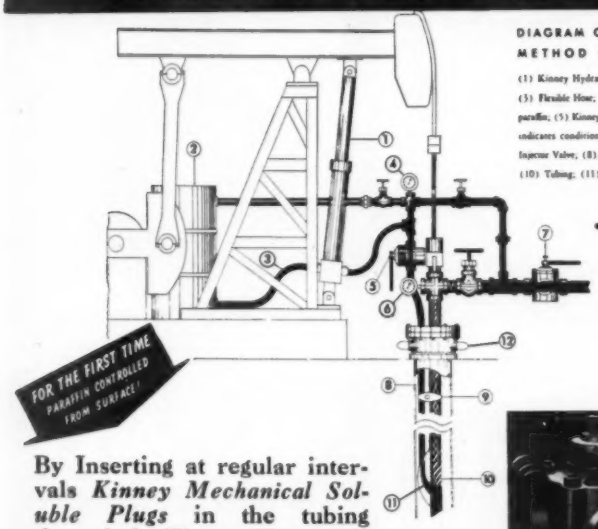

DIAGRAM OF HOOK-UP AND METHOD OF OPERATION

(1) Kinney Hydraulic Pump; (2) Supply Tank; (3) Flexible Hose; (4) Gauge, indicates removal of paraffin; (5) Kinney Plug Injector Valve; (6) Gauge, indicates condition of paraffin; (7) Kinney Plug Injector Valve; (8) 1" Tubing; (9) Parallel Clamp; (10) Tubing; (11) Crossover; (12) Parallel Head.

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Permian Basin

Wildcat Near Pegasus Completed in Pennsylvanian

MIDLAND.—C. W. Murchison 1 Joe Cannon, Midland County discovery or northwest extension to Pegasus field, has been completed from the Pennsylvanian. Daily potential was 480 bbl. of 44.4°-gravity oil in 24 hours, from casing perforations at 10,465-85 ft. Gas-oil ratio was 1,680 cu. ft.

The well at first had good flowing production from both the Pennsylvanian and the Ellenburger, but perforations in the lower formation from 13,105-60 ft. had to be squeezed when water set in. Ellenburger top was 13,122 ft., minus 10,240 ft. An offset test may be drilled to the Ellenburger, according to reports.

Sinclair Oil & Gas Co. completed its 6-A Sanders as an east extension on the north side of Sweetie Peck field. Potential was 420 bbl. of 43°-gravity oil through 18/64-in. tubing choke from perforations at 10,330-60 ft., total depth.

The Texas Co. 2-A Scharbauer, half-mile west outpost to the one-well Warfield field, reported 90 ft. of drilling mud on a 5-hour drill-stem test at 9,150-9,355 ft. It was drilling ahead at last report.

Texas' 1-B Scharbauer, wildcat, 2½ miles southwest of Ralph Lowe's 1 Hill, completed Dean sand discovery, was drill-stem testing in lime and shale at 9,335-9,490 ft.

In Martin County, Gulf Oil Corp. 2-E-B Glass, Ellenburger project which has already established discovery production from the Pennsylvanian, was coring ahead from 10,582 ft. after flowing 99 bbl. of oil in 13½ hours. The flow was without acid and through ½-in. tubing choke from open hole at 10,400-10,582 ft.

In southeast Martin County, Plymouth Oil Co. was ready to drill plug from casing liner cemented at 7,766 ft., 9 ft. off bottom, at its 1 Jeff Davis. After drilling out, the liner was to be perforated and the Spraberry sand treated with Hydrafrac.

Star Oil Co. 1-B Blanche Young, south offset to the discovery of North Polar Ellenburger field in Kent County, was dry at 7,851 ft. in the Ellenburger topped at 7,800 ft. The formation developed some oil and gas and salt water.

In northern Kent, about 7 miles west of Girard, Jack L. Hamon 1 Girard Trust estate was drilling below 7,388 ft. in Mississippian lime and chert.

Magnolia Petroleum Co. 1 Sam Preston, Midland County wildcat, was preparing to test the entire Spraberry sand section before attempting completion. Operators were drilling plug from 7-in. casing, set at 7,220 ft., and were to treat with Hydrafrac and test in open hole to 7,245 ft., corrected total depth. Following the open-hole test, it was to core ahead to 7,315 ft. and test from 7,245-7,315 ft., then back up the hole and make tests on several sand strikes in the top of the sand.

South of Midland, G. H. Vaughn Production Co. 1 Campbell logged good shows of oil in a limestone stringer in the Spraberry section, from 8,184-8,206 ft. A drill-stem test was in progress.

Humble Oil & Refining Co. 1 Klapproth, north offset to the Midkiff field discovery, swabbed 38 bbl. of oil in 10 hours, from the Spraberry, at 7,350 ft., total depth. Operators were coring ahead below 7,359 ft.

North of San Angelo in Tom Green County, Scherck and Wahlenmaier 1 Llano County School land, found the Ellenburger at 6,370 ft., minus 4,204 ft. That top was said to check some 100 ft. high to Bridwell Oil Co. 1 Robbins, 6,501-ft. failure to the southwest, and 15 ft. low to Humble's 1 Schuch, 6,685-ft. dry hole in Coke County to the northeast. Drilling in the Llano test dropped from 14 to 6 minutes per foot at 6,386 ft. and samples had some fluorescence and oil shows. However, a 30-minute drill-stem test from 6,372-86 ft. produced a light

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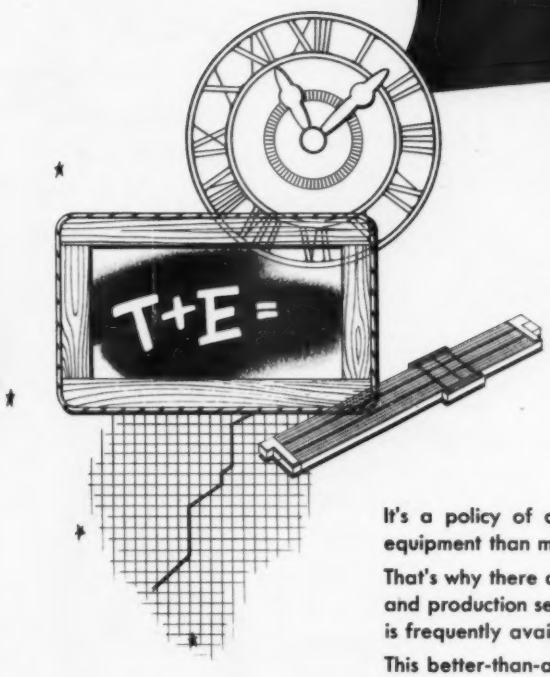
BLUE ANSWER TO TIME... AND ECONOMICS



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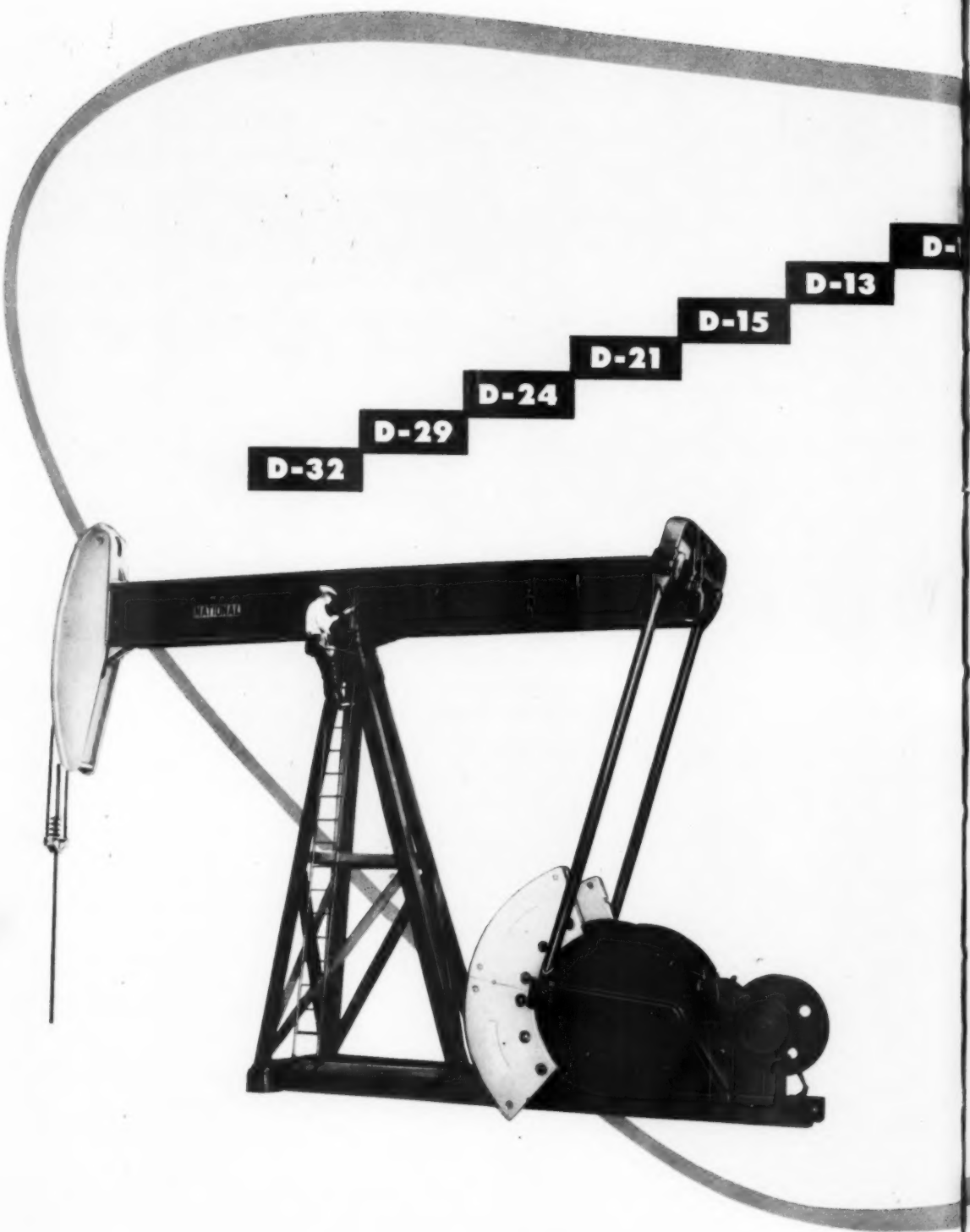
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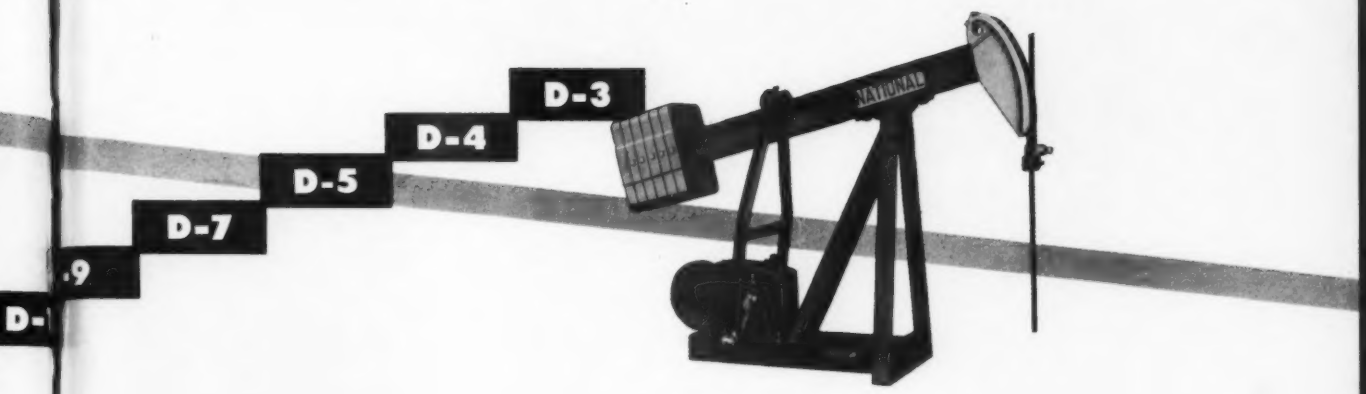

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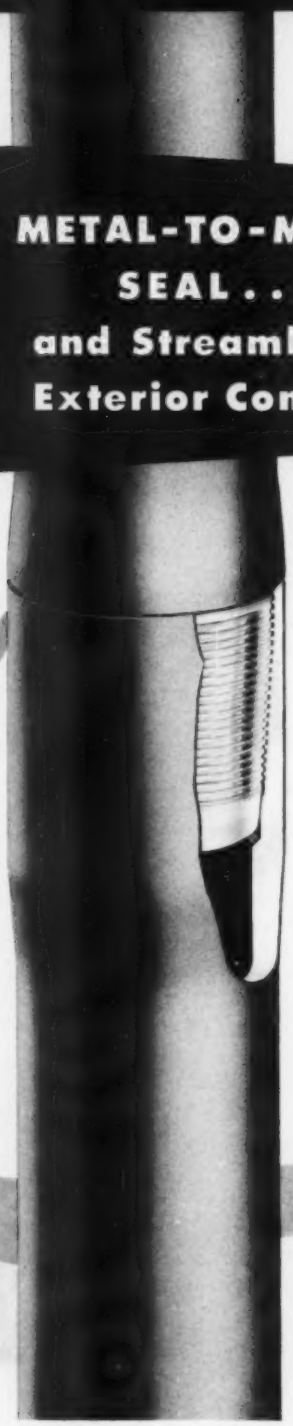

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blow of air and recovered 30 ft. of mud with no shows.

WEST TEXAS (DISTRICTS 8 & 7-C) SUCCESSFUL WILDCATS

Midland County: Ralph Lowe 1 J. E. Hill, 30-39-2s-T&P, TD 13,043 ft., PB 9,350 ft., elev. 2,825 ft., perf. Dean sand 9,125-9,240 ft., flowed 276 bbl. 41°-gravity oil a day, 24/64-in. choke, GOR 953 cu. ft., TP 950 psi.

Schleicher County: Hiawatha Oil & Gas Co. 1 J. Forrest Runge, 66-M-GH&SA, 3 mi. NE Hulldale, TD 5,675 ft., elev. 2,215 ft., Pennsylvanian pay 5,614 ft., flowed 471 bbl. 40°-gravity oil a day, ¼-in. choke, GOR 1,800 cu. ft., TP 1,900 psi.

WEST TEXAS (DISTRICTS 8 & 7-C) WILDCAT FAILURES

Crockett County: R. W. Fair et al 1-A University 51, 18-51-University Lands, dry, TD 1,905 ft.

Garza County: L. M. Glasco and Spartan Drilling Co. 1 Emery Trust, 39-2-H&GN, dry, TD 7,572 ft., elev. 2,274 ft., Pennsylvanian 6,165 ft., reef lime 6,170 ft., Canyon reef 6,468 ft., Strawn 6,850 ft., Mississippian 7,545 ft.

Hockley County: George F. Livermore, Inc. 1 Wells-Hassell, Lab. 13, Lge. 3, Jones CSL, dry, TD 10,125 ft., elev. 3,355 ft., San Andres 3,890 ft., Pennsylvanian 9,960 ft.

Brinkerhoff Drilling Co. 1 E. Jones, 18-34-T&P, dry, TD 9,720 ft., elev. 2,606 ft., Spraberry 6,629 ft., Dean 7,915 ft., Strawn 9,285 ft., Wolfcamp 9,170 ft.

Kent County: Ryan, Hayes, & Burke 1 Branch, 240-F-H&TC, dry, TD 6,695 ft., elev. 1,959 ft., Palo Pinto 5,527 ft., Mississippian 6,612 ft.

King County: Humble Oil & Refining Co. 1-B Masterson, 10-A-R. M. Thompson Sur., 12 mi. NE Guthrie, dry, TD 6,575 ft. in dolomite.

Kingwood Oil Co. 1 W. R. Ross, 88-A-

(Continued on page 139)

Canadian Fields

Three New Natural Gas Strikes for Alberta

CALGARY.—Natural gas assumed new importance in Alberta this week, as three wildcats in the province chalked up natural gas discoveries. Two of the new gas strikes are in northwestern Alberta, while the third is on the southern plains.

The northwest discoveries include one for the Hudson's Bay Oil & Gas Co. and Union Oil Co. of California team, and the other for Imperial Oil, Ltd. The H. B.-Union strike was made at North Tangent 1 well, in LSD 16, 34-80-24w5, about 23 miles southwest of Peace River town. The Shell Oil Co.-British American Oil Co. Bluesky and Whitelaw gas discoveries are 18 to 23 miles northwest of the Tangent strike. The H. B.-Union well blew wild last week, and has been on the rampage since that time, with natural gas flow rate estimated at over 25,000,000 cu. ft. daily. Wild-well experts now at the site are attempting to bring the well under control. The well, bottomed at 3,274 ft., showed natural gas in sizable volumes from three zones during drill-stem tests in the Peace River sand, the Gething sand (basal Lower Cretaceous), and the Triassic.

About 50 miles south of Peace River town and 55 miles southeast of the Shell-British American gas discoveries, Imperial Oil, Ltd., found a new source of natural gas. The find was made at Imperial-Little Smoky 1, in LSD 14, 15-75-22w5. A large potential at that well is indicated in the zone from 3,090 to 3,120 ft. Drill-stem tests in that interval gave flow rates between 8,000,000 and 10,000,000 cu. ft. daily.

This week's southern Alberta gas strike was made by Canadian Delhi Oil, Ltd., on farmout lands from Socony-Vacuum Exploration Co., in the Countess area. The well, Delhi-Socony-Countess 1, in LSD 7, 8-21-16w4, is 4 miles southeast of Countess town, 80 miles east and slightly south of Calgary. Drill-stem tests in the Bow Island (or Viking sand) series, in the interval 2,877 to 2,915 ft., gave gas flow rates up to 2,688,000 cu. ft. daily.

Naco, Ltd., has placed its second Drumheller oil well on steady production, and is moving rig for an immediate start at its next venture, ¼ mile west of the new producer. Naco 3, in LSD 11, 36-29-20w4, completed at 4,494 ft., and during a 24-hour test through 3/8-in. choke the well rated oil at 10 bbl. hourly. Output will be cut down to around 50 bbl. daily for steady production. Gravity of the oil is around 32.1°, and comes from the "Naco sand," in the basal section of Lower Cretaceous.

Crew at the Canadian Gulf-C.P.R.-Collins 7 basal Cretaceous oil discovery well has drilled out cement plug to 4,267 ft., and is continuing to swab and test. The well, located in LSD 7, 19-36-19w4, about 87 miles northeast of Calgary and midway between Stettler and Big Valley fields, found two productive sands. The top sand is at 4,162-74 ft., while the second sand is at 4,200-08 ft. Both sands are now being tested together, prior to deciding on completion procedure.

Hole was drilled to 6,350 ft., as a test of Devonian possibilities, but was plugged back and 5½-in. casing was set at 4,157 ft., with tubing landed at 4,257 ft. Gravity of the oil is around 29.5°.

Manitoba.—Officials estimate that since the recent oil strike in the Virden area operators have signed up about 85 per cent of the 1,900,000 acres in the region. Both American and Canadian companies are active in the play, and land title offices were reported swamped with lease registrations.

California Standard-Daly 10-18 is spudding in 1,300 ft. south of the discovery, California Standard-Daly 15-18, which is

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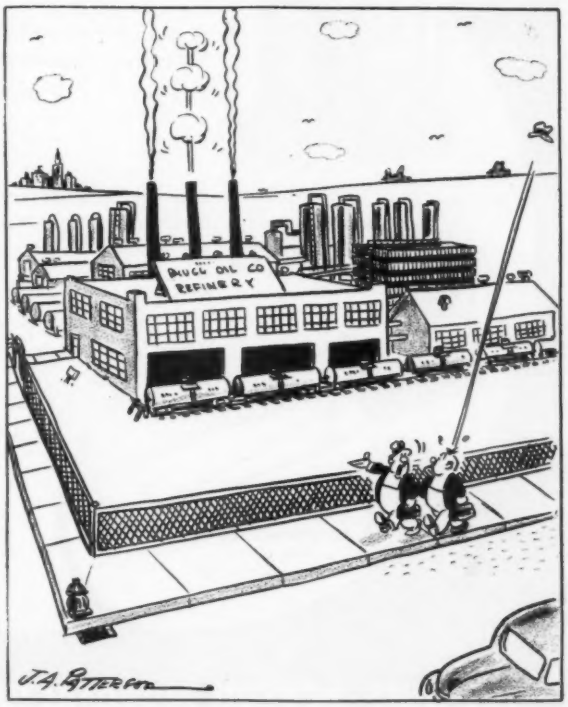

THE OIL AND GAS JOURNAL

"Yeah. That one's got th' hiccups!"

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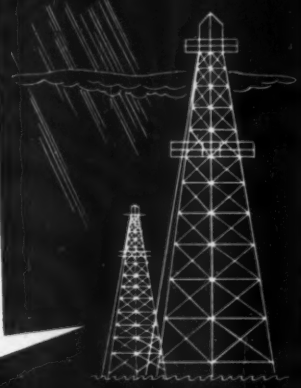

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8½ miles west of Virden. The new venture will be carried to 2,500 ft., producing depth in the first well. The Daly 15-18 is starting pumping tests after swabbing 3 bbl. of fluid per hour. Recovery was 35°-gravity crude with a 30 per cent water cut.

CANADIAN WILDCAT FAILURES

Homestead-South Calmar 1, LSD 5, 31-48-26w4, TD 6,509 ft.

Liberal Pete-Anderson 1, LSD 11, 1-46-23w4, TD 5,505 ft.

Seaboard-Sander Lake 1, LSD 11, 34-80-2w5, TD 3,214 ft.

Louisiana-Arkansas

New Pool Prospect In Miller County

SHREVEPORT.—In Miller County, Arkansas, Lee & Markham Production Co. and Allyn 1 Price promised production 2 miles northwest of Cypress Lake field. Located in SW SW NE 18-16s-25w, the well is bottomed at 3,600 ft. with 5½-in. producing string set to 3,370 ft. Operators received oil and gas on a drill-stem test between 3,390-96 ft., and plan to test at 3,306-20 ft. in the Paluxy where they found 12 ft. of sand and shale with a show of oil.

In Union County, C. H. Murphy & Co. will drill an 8,000-ft. Smackover test in old Wilks field abandoned in 1946. The 1 Gottschall, NE SE 3-18s-18w, 2 miles northwest of Schuler field, is a west offset to Atlantic Refining Co.'s 1 Murphy, 2-18s-18w, opener of the one-well pool. Drilled in 1943, the 1 Murphy produced 10,000 bbl. of oil before it was abandoned. Atlantic drilled its well to 7,943 ft.

In the same county, Roberts Petroleum Co. 1 Hill, 5-18s-13w, recovered oil and salt water from a perforated interval at 2,644-46 ft. Operator will continue to test at this outpost to West Urbana field.

Gulf Refining Co. 1 Pittman resumed drilling after recovery of stuck fish at 7,171 ft., and is below 7,295 ft. Located in 9-17s-20w, Columbia County, the well is a Smackover lime test.

In North Louisiana, two important Caddo Parish wildcats continued testing. Gulf Refining Co.'s deep test in Caddo-Pine Island field, the 279-N Caddo Levee Board, perforated the Pettit at 4,976-88 ft. and acidized with 6,000 gal. The well cleaned itself, flowing acid water. Later it began flowing gas with a spray of distillate through a 20/64-in. tubing choke with tubing pressure of 1,650 psi. Open flow production at that time was estimated at 15,000,000 cu. ft. of gas per day. Gulf drilled the well to 7,993 ft., and ran 5½-in. casing to 6,754 ft. The latest test recovered 1,700,000 cu. ft. of gas plus 5 bbl. of distillate per million cu. ft. per day. A 15/64-in. choke was used, and tubing pressure was 1,725 psi. A state potential has been scheduled. This is the first Pettit lime production in the field. Operators had previously tested the Travis Peak and Hosston. The new pay is spotted in 11-20n-16w.

Plymouth Oil Co. 1 Webb, 5-16n-13w, acidized and tested perforations at 4,747-51 ft., obtaining a slight gas show. Tests of perforations in the Rodessa at 4,800-03 ft. and 4,780-82 ft. were not encouraging. The well is waiting on cement after setting plug at 4,770 ft., and squeezing perforations from 4,749-57 ft. Should further tests of this section fail, operator plans to retest the two deeper Rodessa intervals.

NORTH LOUISIANA WILDCAT FAILURES

Franklin Parish: Carnes & May 1 Clarke, 1,613 ft. W and 330 ft. S of NE corner 7-15n-8e, dry, TD 4,410 ft.

Morehouse Parish: Sunray Oil Corp. 1 Schenley, C SE NW 27-22n-8e, dry, TD 6,088 ft., elev. 100 ft., Travis Peak 2,742 ft., Cotton Valley 4,130 ft., Smackover 5,907 ft.

Sabine Parish: Union Oil Co. of California 1 Slavoc Crnkovic, NE SE SW 26-7n-

13w, dry, TD 5,730 ft., drilling break 5,573-80 ft. and 5,588-93 ft., show of oil and gas in cuttings, rec. 1 gal. oil and salt water, DST 5,689-5,708 ft., open 20 min., rec. 1,620 ft. oil-cut salt water.

ARKANSAS WILDCAT FAILURE

Hempstead County: C. H. Bigsby 1 A. R. Avery, 300 ft. S and E of NW corner 4,11s-23w, dry, TD 2,204 ft.

Illinois-Ind.-Ky.

First Oil Indicated for Central Indiana County

FIRST oil production for Monroe County, in central Indiana, is in prospect where a wildcat being drilled by John I. Easter and J. B. L. Drilling Co. has found good saturation in Trenton sand logged at 1,739-45 ft. Drilling with cable tools, the well, 1 Ben Deckard, SE SE NE 33-7n-1e, filled 300 ft. with green, high-gravity oil in 12 hours after entering the pay, and at the present total depth of 1,745 ft. has 600 ft. of oil in the hole. It entered the pay with only 1 bbl. of drilling water in the hole. Last casing (7-in.) was run at 1,292 ft.

The location is in the extreme southern part of the county, just ½ mile north of the Lawrence County line. It is about 12 miles northeast of Bedford, in the latter county, and about the same distance southeast of Bloomington, Monroe County. It is north of an old, abandoned shallow gas producing area (Bartlesville pool), and about 6 miles northwest of an old, abandoned shallow oil pool (Heltonville). Nearest present oil production is more than 30 miles southwest in the Loogootee area of Martin County.

Discovery of a new Jackson sand pool is indicated in Vanderburgh County, Indiana. A. J. Slagter 1 Kissell, SW SW NE 30-4s-10w, logged good saturation in that pay at 1,963-88 ft., and after being drilled to 2,389 ft. has casing run to 1,964 ft. for testing. A drill-stem test of the zone yielded 300 ft. of clean oil, 90 ft. of mud-cut oil, and 90 ft. of salt water. Tester was open 1½ hours. Bottom-hole pressure registered 800 psi. The location is just southwest of the town of Stacer, 11 miles northwest of Evansville, and about 1½ miles northwest of production in the Stacer pool.

Interest in the area about 2 miles southwest of Monroe City, Knox County, Indiana, is being revived by oil showings found in Aux Vases sand by Davis Lambert at his 1 Verne Junkins, NWc NE Militia Donation 166-2n-9w. Saturation was logged at 1,510-17 ft. A 30-minute drill-stem test of this interval had gas at the top within 20 minutes, and yielded 100 ft. of oil and 80 ft. of oil-cut mud. No water was indicated. Total depth is 1,519 ft. with 5½-in. oil string at 1,498 ft. The location is near a lone, small well completed more than a year ago, but more than 1½ miles west of the Monroe City pool, nearest other production.

Another new productive spot also is indicated in Posey County, Indiana, where George & Wrather found oil and gas showings in Cypress sand at their 1 Vogel, SE SE NE 20-6s-14w. It is a mile southwest of the new south extension area of the Welborn pool, where production is from Waltersburg sand. The prospective pay zone is at 2,503-18 ft. with bottom of the hole still in the sand. A 2-hour drill-stem test taking in an interval at 2,491-2,511 ft. got 180 ft. of gas and 240 ft. of gas and mud-cut oil. Another test with hole deepened to 2,518 ft. got 150 ft. of gas, 210 ft. of oil-cut mud, and 125 ft. of mud-cut oil.

In western Franklin County, Illinois, La-Grange Petroleum Co. 1-B Harrison, NWc SW 24-6s-1e, swabbed 18 bbl. of oil and 8 bbl. of water per day while testing an O'Hara lime prospective pay zone at 2,670-81 ft. Pay was treated with 500 gal. of acid. Total depth is 2,819 ft. The location is just north of Christopher.

ILLINOIS WILDCAT FAILURES

Bond County: J. A. McDonald 1 Baumgartner, SW NE SE 32-4n-4w, dry, TD 2,213 ft.

Clay County: Kingwood Oil Co. et al., 1 Burge, SW NW NE 24-5n-5e, dry, TD 2,607 ft.

Edgar County: J. R. Heinden 1 Sudduth, SW SW NE 31-14n-12w, dry, TD 1,359 ft.

Saline County: James M. Miller 1 Pankey, SE SE SW 11-8s-7e, dry, TD 3,035 ft.

Vermillion County: C. B. Mansfield 1 Smith-Willison, SE NW NW 15-17n-11w, dry, TD 1,477 ft.

INDIANA WILDCAT FAILURES

Gibson County: Sun Drilling Co. 1 Johnson, NE NE NW 29-2s-11w, dry, TD 2,340 ft.

Knox County: George & Wrather 1 Hollingsworth, SE SE SW Militia Donation 195-4n-9w, dry, TD 1,690 ft.

Pike County: National Associated Petroleum Co. 1 Tislow, NW NW NE 36-1n-8w, dry, TD 1,784 ft.

EASTERN KENTUCKY

ASHLAND.—In Wolfe County and 5 miles south of Campton, Roy Davis et al have a prospective oil well at 1 Sherman Bradley, Corniferous lime, topped at 1,343 ft., had oil pay at 1,376-81 ft., total depth. At total depth well is reported to have filled up 500 ft. in 35 minutes. Operators will test.

In Pilot, East pool along the Wolfe and Powell county line, three more producers have been completed by Albert Dodge, agent on J. B. White heirs lease. Topping productive Corniferous lime at an average total depth of 906 ft. and bottomed at about 1,013 ft., wells made an average of 14 bbl. daily. Wells completed were 28, 29, and 30.

In Isonville pool of eastern Elliott County, Long & Arnett 2 D. N. Oliver made 60 bbl. of oil after shooting Weir sand at total depth 1,152 ft. Operators continue testing.

Rocky Mountain

Upper Valley, Utah, Well To Deepen to Devonian

DENVER.—The California Co. is moving in rotary to deepen 1 Unit, C SW NW 12-36s-1e, wildcat in the Upper Valley area, Garfield County, Utah, which was completed in 1949 as a small discovery in the Mississippian. The well is located in the Kaiparowitz region covering the south-central part of the state, and was the first to this depth in that portion of Utah. California did extensive testing and completed the well pumping a high of 136 bbl. of 17°-gravity oil and 714 bbl. of water daily from a Mississippian limestone pay at 8,765-91 ft. The operator will deepen between 1,000-1,500 ft. for a test through Devonian. Although not considered a commercial discovery at the time of completion, the well has been shut in awaiting orders, with frequent testing periods. Top of Kaibab was logged at 6,040 ft., Coconino 6,200 ft., Rico Supai 8,033 ft., Hermosa 8,396 ft., and the lime pay 8,777 ft. Casing was cemented at 8,765 ft. for the first completion. While testing this well California drilled another wildcat failure, with hole junked, at Johns Valley, northwest of Upper Valley. The operator has reportedly done additional work through this region and may play additional tests on other surface structures through the area following completion of the present deepening.

Tests following oil shows in cores of another northeastern Colorado wildcat failed to show production this week, but additional wildcats are scheduled for the Denver-Juiesburg Basin area. J. E. Manning, on a Carter Oil Co. farmout, found shows in cores of the Dakota sand at 1 Siemers, SE SE SE 32-2n-48w, on the Yuma prospect, Yuma County. The test was made between 3,775-85 ft., with tool open 1 hour, and the recovery was 810 ft. of slightly sulfur water. The operator is drilling below 3,860 ft. for a test of Lakota. Skelly Oil Co. announced location for its first operation in northeastern Colorado with the well at 1 Scott-Wollever, NE NE SE 30-6n-55w, in Morgan County. Skelly has large lease holdings through both the Colorado and western Nebraska portions of the basin. British-American Oil Producing Co. and Shell Oil Co. are continuing development drilling in Yenter and Mount Hope pools, Logan County, following recent excellent completions.

Shell Oil Co. this week completed an extension, or possible discovery, 2 miles east of production in the South Glenrock area, Converse County, Wyoming. Well 1 Government, SW NW SW 15-33n-75w, flowed 548 bbl. of oil daily through open tubing from the Dakota sand. Production is from Dakota between 7,090 and 7,131 ft., and the well is some 800 ft. lower structurally than Dakota sand producers to the west. Completion of the well opens production possibilities for a much larger area than expected from development in South Glenrock pool proper, and a more active drilling campaign is expected. No shows were found in Muddy sand in this well, although that formation is also productive in South Glenrock wells to the east.

WYOMING WILDCAT FAILURES

North Kaycee unit, Johnson County: Continental Oil Co. 1 unit, NE SW SE 9-44n-82w, TD 3,882 ft., dry. first Wall Creek 684 ft., second Wall Creek 945 ft., Muddy 1,858 ft., Dakota 2,040 ft., Lakota 2,135 ft., Morrison 2,174 ft., Sundance 2,424 ft., first Bench Sundance 2,439 ft., lower Bench Sundance 2,623 ft., Jelm 2,736 ft., Chugwater 2,747 ft., Embar 3,410 ft., Tensleep 3,784 ft.

Ash Creek, Sheridan County: H. P. Hayes 1 McKenna, NE SW NE 26-58n-85w, TD 5,517 ft., dry, Eagle 4,155 ft., Sussex 4,760 ft., Shannon 5,003-26 ft.

Barrel Springs, Unita County: E. L. Doheny 1 Gov't., C SE SW 9-16n-116w, TD 6,289 ft., dry, Thaynes 2,190 ft., Woodside 2,758 ft., Dinwoody 3,454 ft., Embar 3,702 ft., Weber 3,992 ft., Fault Dinwoody 4,465 ft., Embar 4,650 ft., Weber 4,940 ft., Fault Upper Cretaceous 5,860 ft.

COLORADO WILDCAT FAILURES

Kiowa Elizabeth, Elbert County: Olds Oil Corp. 1 Barnes, C NW NW 27-7s-64w, TD 309 ft., suspended indefinitely.

Mancos, Montezuma County: Slick-Moorman Oil Co. 1 Weber, C SE NE 1-35n-14w, TD 6,701 ft., dry, Dakota 610 ft., Morrison 800 ft., Summerville 1,050 ft., Entrada 1,550 ft., Wingate 1,755 ft., Chinle 2,300 (?) ft., Shinarump 2,865 ft., Moenkopi 2,930 ft., Cutler 2,110 ft., Rico 4, 555 (?) ft., Hermosa 4,780 ft., Paradox 5,700 ft., Paradox salt 6,336 ft.

NEBRASKA WILDCAT SUCCESS

Dalton area, Cheyenne County: Recco Oil-C. E. Stout 1 Foy, NE NE NE 30-17n-49w, TD 5,014 ft., pumped 70 bbl. oil per day. Niobrara 3,740 ft., Greenhorn 4,280 ft., "D" sand 4,545 ft., "J" sand 4,690 ft.

NEBRASKA WILDCAT FAILURE

Dalton area, Morrill County: Rock Hill Oil and Twin Oil Co. 1 Narjes, SE NE NW 11-17n-49w, TD 4,389 ft., dry. First sand 4,206 ft., Niobrara 3,427 ft., Greenhorn 3,942 ft., "D" sand 4,192 ft., "J" sand 4,343 ft., Fort Hays 3,749 ft., "G" sand 4,252 ft.

LEGAL

U. S. DEPARTMENT OF THE INTERIOR, Bureau of Land Management, Washington 25, D. C. Notice is hereby given that 1669.44 acres in T. 11 N., Rs. 57 and 58 E., and T. 10 N., R. 58 E., P.M., Montana, within the known geologic structure of the Cedar Creek field, will be offered in five parcels for oil and gas leasing, through competitive bidding, at 1 p. m., Eastern Standard Time, March 21, 1951, when bids will be opened. The details of the lease offering, how and where to file bids, and a description of the lands may be obtained by addressing an inquiry to the Manager of the Land Office at Billings, Montana, or to this office. Marion Clawson, Director.

XUM

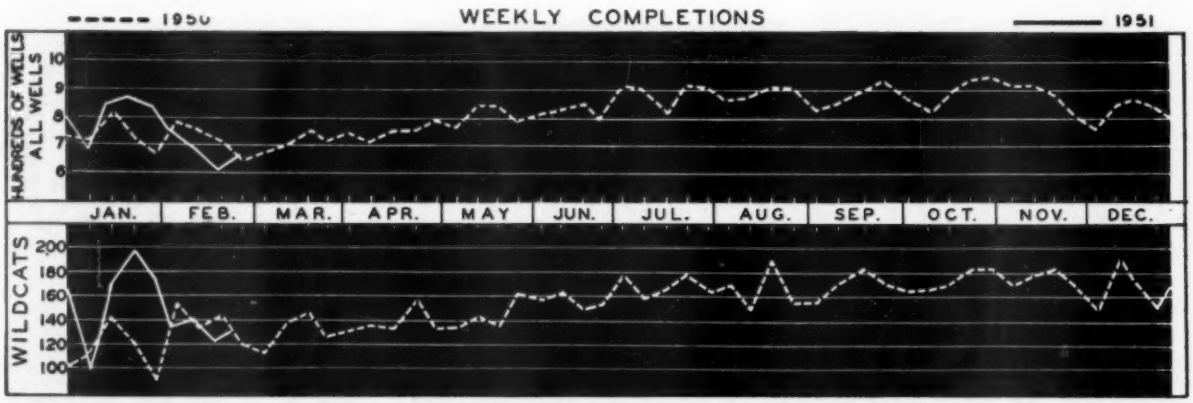
CURRENT STATISTICS

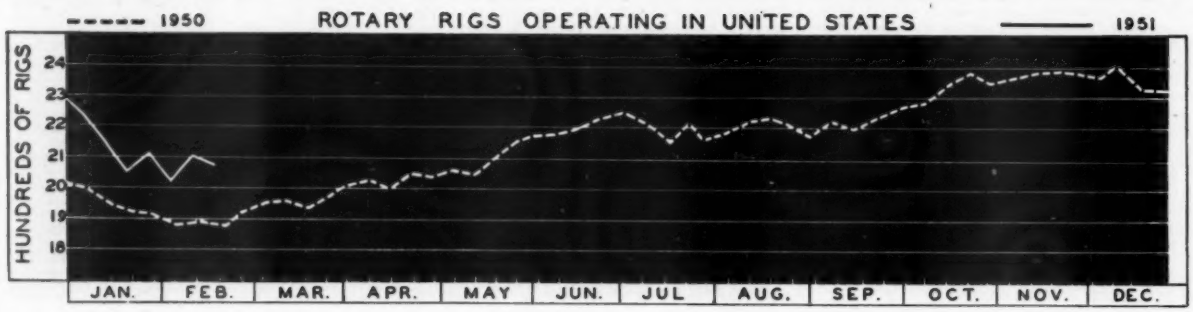
EXPLORATION

WEEKLY WELL COMPLETIONS . . . . WEEK ENDED FEBRUARY 24, 1951

	Total of all wells					Feb. 24		Wildcat completions and discoveries					Cumulative total, 1951				
	Comp.	Oil	Gas	Dry	Footage	1951	1950	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	7	4	0	*3	10,192	56	103	0	0	0	0	0	0	0	0	0	0
Pennsylvania	14	6	3	†5	24,562	118	173	0	0	0	0	0	0	0	0	1	1
West Virginia	16	4	9	3	45,620	103	94	0	0	0	0	0	0	0	3	2	5
Ohio	10	4	1	‡5	18,087	122	143	0	0	0	0	0	1	0	1	5	7
Indiana	14	4	0	10	16,082	147	148	0	0	0	3	3	3	0	0	19	22
Kentucky	7	6	0	‡1	9,159	121	121	0	0	0	0	0	2	0	0	17	19
Illinois	35	18	0	17	93,223	317	339	0	0	0	5	5	7	0	0	46	53
Michigan	11	4	0	7	30,989	95	119	0	0	0	3	3	0	0	1	33	34
Kansas	68	37	2	29	233,005	609	499	2	0	1	16	19	28	0	2	110	140
Nebraska	7	5	0	2	21,709	47	9	1	0	0	1	2	1	0	1	16	18
Oklahoma	85	48	3	§34	318,158	833	709	4	0	0	7	11	34	0	5	108	147
Texas	273	148	21	104	1,162,765	2,402	2,319	9	0	0	53	62	91	9	12	404	516
North Central (Dist. 7-B & 9)	81	34	1	46	254,700	713	688	4	0	0	20	24	43	0	0	163	206
West (Dist. 7-C & 8)	75	53	0	22	386,452	716	662	2	0	0	10	12	20	1	0	86	107
Panhandle (Dist. 10)	27	10	15	2	83,230	126	183	0	0	0	1	1	0	0	0	5	5
Eastern (Dist. 5, 6, & 6-P)	19	9	0	10	69,893	168	166	0	0	0	8	8	0	0	0	29	29
Gulf Coast (Dist. 2 & 3)	33	22	4	7	189,589	351	323	2	0	0	5	7	18	6	10	57	91
Southwest (Dist. 1 & 4)	38	20	1	17	178,901	328	297	1	0	0	9	10	10	2	2	64	78
Louisiana	33	19	1	13	240,623	315	385	2	0	0	5	7	7	0	0	45	52
Northern	14	5	1	8	56,367	149	203	0	0	0	3	3	2	0	0	25	27
Southern	19	14	0	5	184,256	166	182	2	0	0	2	4	5	0	0	20	25
Arkansas	9	5	0	4	30,761	65	60	0	0	0	1	1	1	0	0	10	11
Mississippi	4	2	0	2	25,469	34	47	0	0	0	1	1	3	1	0	13	17
Southeastern States	1	1	0	0	3,710	11	10	0	0	0	0	0	0	0	0	2	2
Montana	0	0	0	0	0	24	21	0	0	0	0	0	0	0	0	2	2
Wyoming	16	9	0	7	79,086	98	97	0	0	0	3	3	2	0	0	17	19
Colorado-Utah	3	1	0	2	10,539	36	17	0	0	0	2	2	0	0	0	20	20
New Mexico	11	9	1	1	48,055	102	113	0	0	1	1	2	1	0	4	12	17
California	39	25	1	13	156,657	279	273	0	0	0	8	8	6	0	1	55	62
Miscellaneous (Md.)	1	0	1	0	3,522	5	1	0	0	1	0	1	0	0	3	2	5
Total United States	664	359	43	262	2,581,973	5,939	5,800	18	0	3	109	130	187	10	33	939	1,169
Total previous week	603	354	44	205	2,475,601	....	....	18	1	1	101	121	169	10	30	830	1,039
Total February 24, 1950	644	362	50	232	2,497,322	....	....	13	0	5	102	120	144	12	37	827	1,020

Service wells included: *3, †5, ‡1, §4.





DAILY AVERAGE PRODUCTION FOR WEEK

	Feb. 24 crude oil	B. of M. Feb. demand	Feb. 17 crude oil
Alabama	2,300	2,400	2,200
Arkansas	80,200	83,000	79,950
California	956,300	968,000	956,800
Colorado	77,600	72,000	74,200
Eastern	52,300	67,000	51,900
Florida	1,600	1,600	1,450
Illinois	156,300	172,000	159,400
Indiana	28,100	31,000	26,400
Kansas	308,100	304,000	319,350
Kentucky	28,100	31,000	27,500
Louisiana	605,200	620,000	605,600
North Louisiana	116,500	.....	116,600
South Louisiana	439,000	.....	439,000
Michigan	41,600	46,000	41,400
Mississippi	100,950	116,000	95,650
Montana	23,100	23,000	20,900
Nebraska	9,800	7,000	10,350
New Mexico	136,325	138,000	136,375
Oklahoma	490,400	483,000	485,950
Texas	2,560,450	2,425,000	2,560,450
Dist. 1 (Southwest)	31,800	.....	31,800
Dist. 2 (Southwest)	152,050	.....	152,050
Dist. 4 (Southwest)	239,800	.....	239,800
Dist. 3 (Gulf Coast)	457,000	.....	457,000
Dist. 5 (Eastern)	46,650	.....	46,650
Dist. 6 (Eastern)	103,800	.....	103,800
East Texas field	272,000	.....	272,000
Dist. 7-C (West)	78,575	.....	78,575
Dist. 8 (West)	864,925	.....	864,925
Dist. 7-B (W. Central)	77,400	.....	77,400
Dist. 9 (N. Central)	146,450	.....	146,450
Dist. 10 (Panhandle)	90,000	.....	90,000
Utah	3,400	5,000	3,300
Wyoming	192,900	180,000	191,100
Total United States	*5,855,325	5,780,000	5,850,175
Change from previous week, up	5,150		
Canada	112,590	.....	104,930

Total U. S. production January 1-February 24 . . †332,786,090 bbl.
Same period last year (crude plus cond.) . . . . . 272,982,890 bbl.

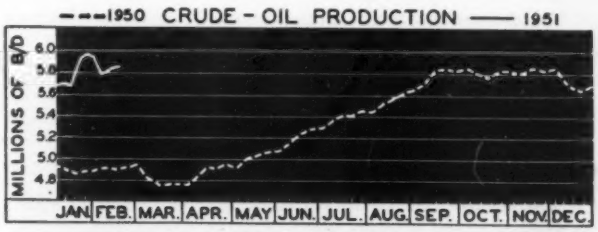
*Not including 107,580 bbl. condensate. †Including 5,748,085 bbl. condensate.

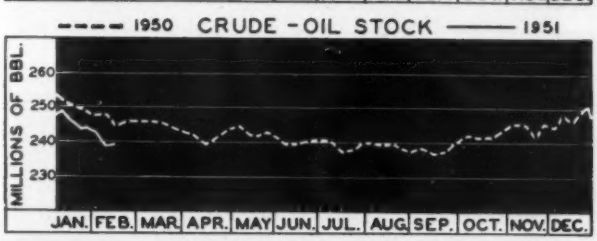
CRUDE-OIL STOCKS BY STATES OR ORIGIN*

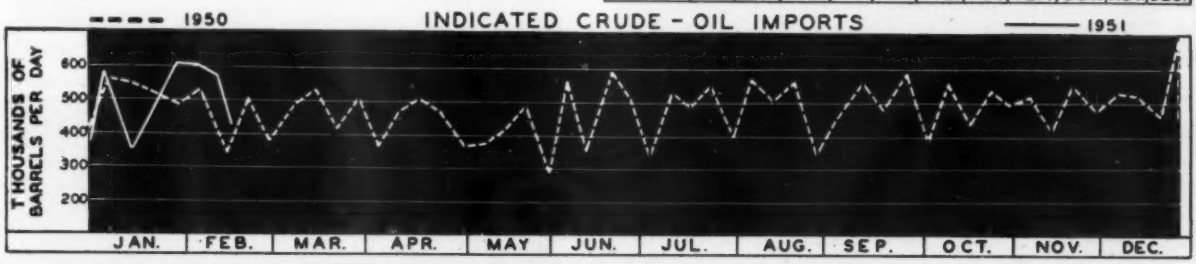
(Thousands of barrels)

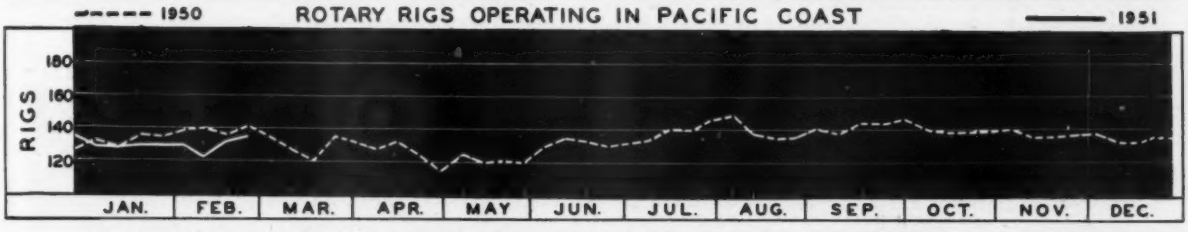
	Feb. 17, 1951	Feb. 10, 1950	Feb. 18, 1950
Pennsylvania Grade	2,058	2,116	2,762
Other Appalachian	1,319	1,287	1,764
Illinois, Indiana, Michigan	10,039	9,996	11,306
Arkansas	2,720	2,757	3,176
Louisiana	14,222	13,607	14,968
North	2,883	2,701	3,799
Gulf	11,339	10,906	11,169
Mississippi	3,222	3,296	2,648
New Mexico	6,997	6,854	7,308
Oklahoma and Kansas	37,234	37,035	35,269
Texas	111,288	110,967	108,074
East Texas	13,868	14,143	14,245
West Texas	43,327	43,170	38,600
Texas Gulf	25,864	25,907	28,605
Other Texas	28,229	27,747	26,624
Rocky Mountain	12,149	12,319	13,467
California	31,397	31,597	37,767
Foreign	6,315	7,042	7,385
Total	238,960	238,873	245,894

*Bureau of Mines.







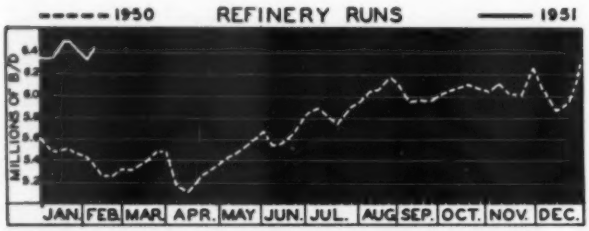


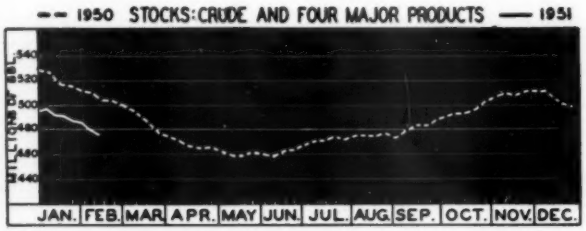
A.P.I. REFINERY REPORT, FEBRUARY 17

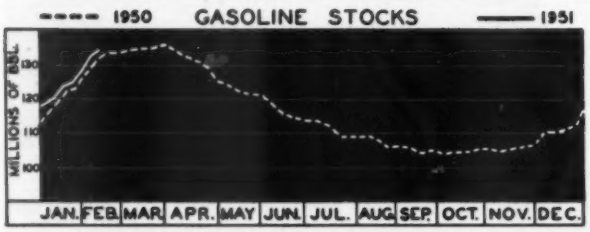
(Thousands of barrels)

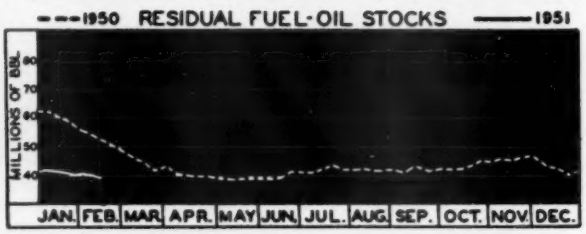
District—	Daily avg. crude runs	Daily average production				Stocks at refineries, bulk terminals, in transit and in pipe lines				Bureau of Mines, February 1950				
		Gasoline*	Kerosine	Distillate	Residual	Gasoline†	Kerosine	Distillate	Residual	Daily avg. crude runs	Daily average production: Gasoline*	Kerosine	Distillate	Residual
East Coast	973	391.9	56.6	225.4	243.8	24,543	5,139	14,906	8,641	784	343.4	36.5	168.6	209.9
Appalachian:														
District 1	104	39.1	6.4	18.0	12.6	2,896	206	502	281	89	39.4	6.3	14.1	12.6
District 2	76	37.1	4.0	9.6	21.7	1,181	61	91	135	63	29.1	4.9	7.2	17.2
Ind., Ill., Ky.	1,238	614.6	79.3	245.3	199.7	30,315	2,879	6,156	3,039	980	496.1	72.2	170.6	169.6
Okla., Kans., Mo.	520	269.3	20.8	114.4	72.3	14,828	616	5,956	1,051	450	254.4	16.6	99.3	65.9
Inland Texas	231	139.6	12.4	31.4	44.1	4,410	294	631	662	206	137.3	12.9	27.8	41.1
Texas Gulf Coast	1,518	632.7	144.3	371.7	255.0	22,824	1,954	7,564	4,973	1,218	579.2	103.5	243.4	226.1
La Gulf Coast	518	238.4	67.6	139.1	61.9	8,934	1,210	2,685	2,129	440	205.5	58.1	92.2	50.0
N. La. and Ark.	76	30.0	6.6	18.6	7.9	2,858	151	922	70	73	27.1	9.2	12.2	15.1
Rocky Mountain:														
New Mexico	14	7.7	.3	2.9	2.9	106	25	66	31	14	7.8	.3	2.5	3.3
Other Rocky Mtn.	209	103.3	8.0	37.7	44.3	4,878	193	1,220	739	175	82.4	5.3	35.7	40.3
California	967	414.2	8.6	133.0	349.4	16,825	586	8,721	18,123	824	350.4	12.4	152.4	320.8
February 17, 1951	6,444	2,917.9	414.9	1,347.1	1,315.6	134,598	13,314	49,420	39,874	5,316	2,552.1	338.2	1,026.0	1,171.9
February 10, 1951	6,338	2,867.0	365.6	1,345.7	1,387.7	133,134	14,693	53,065	40,206	.....	.....	.....	.....	.....
February 18, 1950	5,278	2,516.7	342.6	984.3	1,108.3	131,647	17,116	58,090	51,336	.....	.....	.....	.....	.....

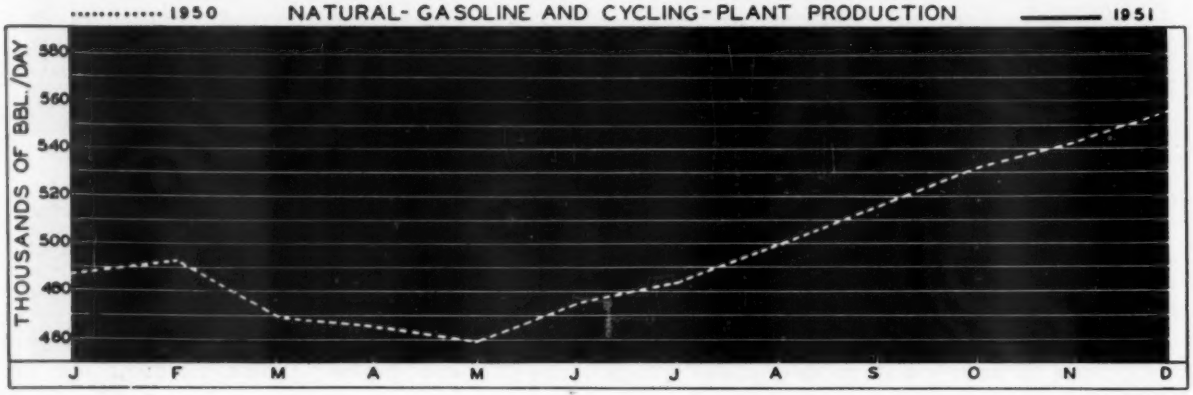
*At refineries including natural blended. †Finished and unfinished.











CRUDE PRICES
GRAVITY SCHEDULE

	Signal Hill, Calif.‡	Okla-homa, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$1.93	....	....	....
19-19.9	1.98	....	....	....
20-20.9	2.03	$2.25	....	$2.12
21-21.9	2.07	2.27	....	2.14
22-22.9	2.12	2.29	....	2.16
23-23.9	2.18	2.31	....	2.18
24-24.9	2.24	2.33	$2.56	2.20
25-25.9	2.30	2.35	2.58	2.22
26-26.9	2.36	2.37	2.60	2.24
27-27.9	2.41	2.39	2.62	2.26
28-28.9	2.46	2.41	2.64	2.28
29-29.9	2.52	2.43	2.66	2.30
30-30.9	2.57	2.45	2.68	2.32
31-31.9	2.62	2.47	2.70	2.34
32-32.9	2.68	2.49	2.72	2.36
33-33.9	....	2.51	2.74	2.38
34-34.9	....	2.53	2.76	2.40
35-35.9	....	2.55	2.78	2.42
36-36.9	....	2.57	2.80	2.44
37-37.9	....	2.59	2.82	2.46
38-38.9	....	2.61	2.84	2.48
39-39.9	....	2.63	2.86	2.50
40 and above	....	....	2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point.

†Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947.

‡Standard Oil Co. of California.

FLAT CRUDE PRICES

Representative posted schedules per barrel.	
East Texas†	$2.65
Kettleman Hills, California*	2.80
Beauregard Parish	2.60
Illinois Basin	2.77
Pecos County, Texas (Yates)	2.35
Bradford, Pennsylvania	4.25
Eastern Ill. and Western Ind.†	2.77
Tomball, Texas Gulf Coast	2.83

*37°-37.9°. †35° and above.

TANK cars for movement of material out of the Mid-Continent are more readily available than they were 10 days ago. However, another condition is developing which will have a decided effect on tank-car movement of heavy fuels.

The general shortage of residual fuels in the East, particularly on the East Coast, is forcing many buyers from eastern Ohio and western Pennsylvania into the Group 3 market. These longer-than-normal hauls will tend to reduce the number of cars available for loading at Mid-Continent refineries. The long hauls also tend to reduce the number of points from which these shipments can be made.

Some suppliers on the Group 3 market have a low ceiling on residual prices. If these suppliers have cars and material to move, they must sell selectively on the spot market to produce the greatest possible return and the maximum movement of oil with a given number of cars. Spot material in suppliers' cars for unrestricted movement will probably be available only at points where the supplier has a ceiling of about $2 a barrel.

Although gasoline stocks east of California are almost 7,000,000 bbl. greater than at this time last year, the general absence of distress gasoline is an outstanding feature of most markets. Most suppliers and resellers are expecting a big gasoline season. Percentage increases in gasoline demand over last year are greater than percentage increases in gasoline stocks.

High tanker rates continue as the reason for a lack of balance between Gulf Coast and East Coast markets. Spot rates still range near the Maritime Commission base plus 200 per cent, and even some longer-term charters are reported at MC plus 85 per cent. This long-term rate would represent a transportation charge of about $.81 a barrel for movement of heavy fuel from the gulf to points north of Hatteras on the East Coast.

REPRESENTATIVE QUOTATIONS

Representative spot-market quotation of leading suppliers as of February 26, 1951. Figures are f.o.b. plant for tank-car shipments in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor (barge)	Texas Gulf Coast
Regular gasoline, 80-82 octane	10⅛-10½	12-12.75	10¾-11
Premium gasoline, 86-88 octane	11¼-11½	13.5-13.75	11½-12
42-44 w.w. kerosine	9¼-9⅜	10-10.1	8¾-9
No. 2 straw fuel oil	8⅜-8⅝	9-9.25	7¾-8
No. 6 residual	$1.80-1.90	$2.25-2.30	$1.75-1.90

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	6⅜	5⅞	6⅛
Grade 18-55	7.65	7.15	7.40

LUBRICATING OILS

South Texas

200 vis., No. 2-3 neutral	13-13.5
750 vis., No. 3-4 neutral	16
2,000 No. 5-6 neutral	18-19

Mid-Continent

150-160 vis., D bright stock, 0-10 pp.	29-30
200 vis., No. 3 neutral, 0-10 pp.	17.5-18.5

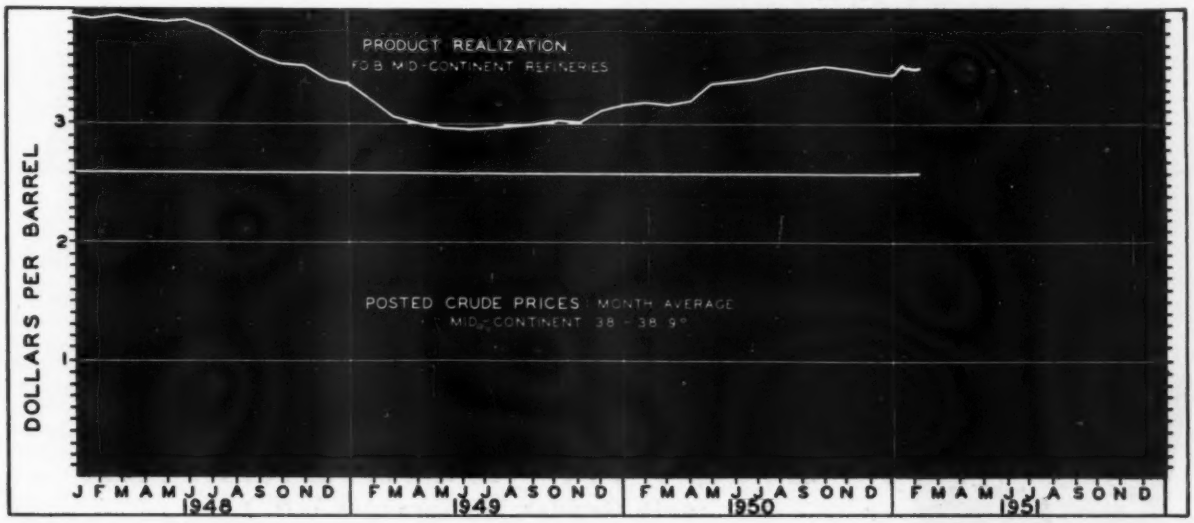
Western Pennsylvania

145-155 vis., 10 p.t. bright stock	32.5
180 vis., 0 p.t. neutral	31.5

WAX

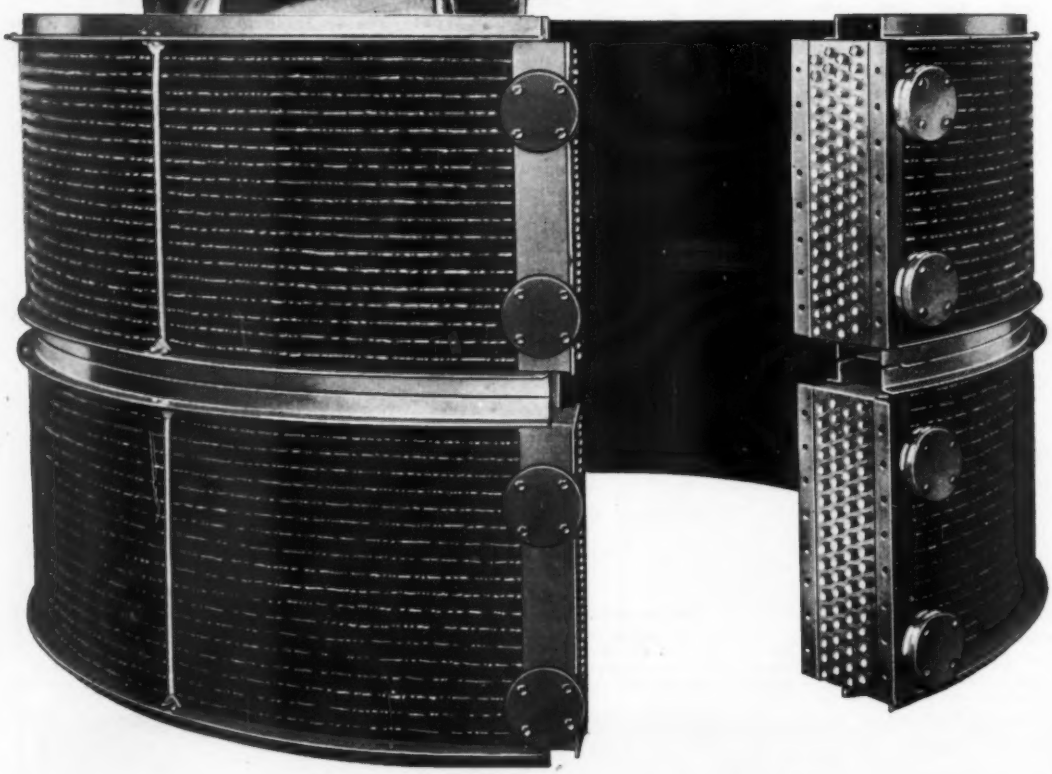
Mid-Continent

132-134 A.M.P.	6.0


PRODUCT REALIZATION
F.O.B. MID-CONTINENT REFINERIES
POSTED CRUDE PRICES MONTH AVERAGE
MID-CONTINENT 38 - 38.9°
DOLLARS PER BARREL
3
2
1
J F M A M J J A S O N D
1948
F M A M J J A S O N D
1949
F M A M J J A S O N D
1950
F M A M J J A S O N D
1951

In this trend chart refinery realization is based on average Mid-Continent grade crude oil (not 38° gravity only) and average prices for refinery products as published in The Oil and Gas Journal basis Oklahoma (Group 3). Refinery yields confined to gasoline, kerosine, distillate, and fuel oil. Realization averaged $3.49 for week ended February 17, $3.48 for previous week, and $3.23 for February 1950.

"Ask the AEROFIN Man"



For the Practical Answer to Your Heat-Exchange Problem . . .

There is a competent Aerofin heat-transfer engineer near you, qualified by intensive training and long experience to find the *right* answer to your own particular heat-exchange problem.

This specialized knowledge is there, ready for you to use to your greatest advantage. Ask the Aerofin man — and be right.

Aerofin is sold only by manufacturers of nationally advertised fan system apparatus. List on request.

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410 South Geddes St., Syracuse 1, N. Y.

NEW YORK • BOSTON • CHICAGO • CLEVELAND • DETROIT • PHILADELPHIA • DALLAS • SAN FRANCISCO • MONTREAL • TORONTO

EQUIPMENT MEN . . . in the News

W. A. Roberts Elected as Allis-Chalmers President

William A. Roberts, executive vice president in charge of the tractor division for Allis-Chalmers Manufacturing Co. since 1947, has been elected president of Allis-Chalmers.

W. A. ROBERTS

Roberts succeeds the late Walter Geist, who served as president from May 1942 until his death on January 29 of this year.

The board also elected four new vice presidents and made other organization changes. W. C. Johnson, formerly executive vice president in charge of the general machinery division, was named executive vice president for the entire company. J. L. Singleton, formerly vice president and director of sales, general machinery division, was named vice president in charge of the general machinery division. Fred Mackey, formerly general works manager, general machinery division, was named vice president in charge of manufacturing, general machinery division.

R. S. Stevenson, formerly general sales manager, tractor division, was named vice president in charge of the tractor division. A. W. Van Hercke, formerly director of engineering, tractor division, was named vice president in charge of engineering, tractor division. John Ernst, formerly general works manager, tractor division, was named vice president in charge of manufacturing, tractor division. Roberts joined the Allis-Chalmers tractor organization as a salesman in the Wichita, Kans., branch in 1924, assigned to territory in northwestern Oklahoma.

Worthington's Oil City Plant to Take Overflow

Sale of the plant and equipment of National Transit Pump & Machine Corp., Oil City, Pa., has been completed and Worthington Pump & Machinery Corp., has taken possession of its facilities.

The miscellaneous overflow from Worthington's other factories will be diverted to the Oil City plant, according to Austin C. Ross, vice president in charge of Worthington's Buffalo plant, who will also have administrative charge of the Oil City plant.

Besides pumps, Worthington manufactures diesel and gas engines, compressors, generators and motors, and equipment for air conditioning and refrigeration, construction, and steam power plants.

William F. Weinreich, formerly assistant superintendent of Worthington's Buffalo machine shop, will be in charge at Oil City as assistant to the vice president. Worthington plans to continue to furnish repair and spare parts for the products of National Transit Pump & Machine Co. now in the field.

Harley Sales Moves to Tri-State Building

Harley Sales Co., exclusive oil-field distributor of Wisconsin air-cooled, heavy-duty engines, recently moved its general offices to more spacious quarters in the Tri-State Building, Tulsa. For more than 23 years the firm has officed in the Atlas Building, Tulsa.

Martin Made Foreign Manager for United

L. A. Martin has been appointed manager of foreign operations for United Geophysical Co., Inc., with headquarters in United's Pasadena office. His duties include supervision of all South American and middle eastern crews.

In line with his new duties, Martin is on an inspection trip of all of United's crews in Venezuela, Brazil, and Chile. He expects to be gone about 2 months.

Dowell Incorporated Expands Fort Worth Office

M. L. STIRLING

A major move in the expansion of Dowell Incorporated's Fort Worth office has been completed, R. D. Shaw, general sales manager, has announced.

Marshall L. Stirling, sales manager of Dowell's Petroleum Division, will head the Fort Worth office. Stirling formerly was located in the Tulsa general office. Also moved into the Fort Worth office to assist Stirling under the new program are Roy W. Allen, from San Angelo, Tex., and Harold L. Ellis, from Odessa, Tex. Both men have been promoted to sales engineers. Stirling has been with Dowell since June 1939 when he accepted a position as sales engineer. He was made sales manager of the Petroleum Division in July 1946.

Allen, who has been with Dowell since 1948, served as a junior service engineer at Wichita Falls and service engineer at San Angelo before moving into the expanded Fort Worth office.

Ellis, a graduate in chemical engineering from Texas A. & M. College, has been with Dowell since June 1949. He has served with Dowell at Levelland, Artesia, and Odessa.

Herbert A. Koch, formerly head of of the Fort Worth office, has been transferred to Houston to establish a

United Holds Annual Sales Meeting at Tulsa

United Supply & Manufacturing Co., of Tulsa, recently held its annual sales meeting in Tulsa. Executives and representatives who attended the meeting are: top row, C. A. Kennedy, H. C. Thornton, L. W. Moore, Paul Smith, E. F. Geary, F. W. Fisher, M. W. Brown, W. T. Hughes, C. G. King, Jr., J. L. Smith, H. B. Gutelius, Frank Wood, Clifford Gilbert, John Gilmartin, Jack Schwartz, R. N. Jones, George Schwenker, and Ben Reagen; front row, W. H. Huey, James Reed, Glenn Wilson, L. V. Jones, R. B. Northrup, H. B. Gutelius, Jr., B. S. Vavra, A. R. Brown, Don Torrance, O. O. Raney, V. R. Lemmons, and W. B. Burch.

XUM

general office sales branch. Koch has been with Dowell since 1944. He began in Oklahoma City as district engineer. He was transferred to Seminole in 1945, then later moved to the Tulsa general office. In March 1949 Koch was moved to Fort Worth as general sales engineer.

Acme Fence & Iron Handles Tough Fencing Installation

Acme Fence & Iron Co., Tulsa, has recently completed a difficult fencing job, according to J. E. (Jack) Sloan, industrial sales representative for the firm.

When a major oil company placed an order for a fence to be installed around a plant in Montana, Acme delivered 30,000 lb. of industrial chain-link fencing by truck from its Tulsa warehouse. Icy, snowbound roads made the trip unusually hazardous.

Acme specializes in supplying and erecting fencing, particularly on oil-industry properties. The organization, owned by Jimmie Jones, is equipped to handle fencing jobs anywhere in the country.

Wright Chemical Names McCumber to St. Louis

Wright Chemical Corp., Chicago, has announced the appointment of Charles W. McCumber as St. Louis district manager. With headquarters in St. Louis, he will be in charge of all Wright water-conditioning sales representatives in Missouri, Arkansas, Tennessee, Kansas, and the southern half of Illinois. McCumber was Midwest regional manager of Feedwater, Inc., for 15 years.

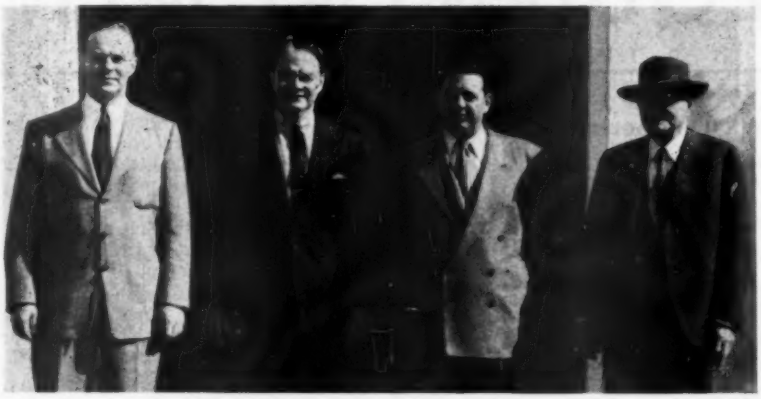
Warner Electric Brake Will Use Institutional Campaign

A new institutional-advertising campaign has been launched by Warner Electric Brake & Clutch Co., Beloit, Wis., according to Steven P. J. Wood, vice president and general manager of the concern.

The campaign is primarily intended to explain to the public how various segments of the nation's industry will fit into the stepped-up defense program. The series of advertisements will appear principally in national and trade magazines.

Warner Electric Brake & Clutch Co., well known in the field of electric brake and clutches for coach and commercial trailers, has recently added a new line of electric brakes and clutches for use on industrial machinery of all types.

Mission Manufacturing Marks Twenty-fifth Anniversary



Mission Manufacturing Co., Houston, is celebrating its twenty-fifth anniversary throughout 1951. This firm was founded in 1925 as Mission Sales Co. In 1932, the company was reorganized as Mission Manufacturing Co. W. Bedford Sharp was president; Dudley C. Sharp, vice president and general manager; W. T. Campbell, vice president and sales manager; and A. M. Foute, secretary and office manager. Four executives of Mission Manufacturing pictured are: Dudley C. Sharp, president; W. Bedford Sharp, board chairman; W. T. Campbell, vice president and sales manager; and Ed Prather, treasurer. Identification of these men was inadvertently omitted when this picture was published last week.

Iverson Holds Division Managers Meeting at Tulsa

Iverson Supply Co. recently held its regular division managers' meeting at its general offices in Tulsa.

The meeting was presided over by S. J. Iverson of Fort Worth, president of the company. Others in attendance were A. M. Iverson, executive vice president; Ed Robertson, vice president, sales; H. B. Downing, secretary-treasurer; and H. D. Lawver, purchasing agent.

Out-of-town division managers included E. E. Zeigler, Artesia, N. M.; Henry F. Oliver, Midland, Tex.; R. B. Yanaway, Houston; and Wayne Wallace, Oklahoma City.

Allegheny Announces Sales Staff Promotions

A series of promotions in the sales department of Allegheny Ludlum Steel Corp. has been announced by Russell M. Allen, vice president in charge of sales.

Dr. R. A. Lincoln has been appointed manager of the sales development and engineering service department. Dr. Lincoln previously has been assistant manager. He succeeds William B. Pierce, who was appointed technical director of the company.

C. R. Mitchell, formerly assistant to the manager of stainless steel sales, has been appointed manager of stainless strip sales. This is a newly created position. R. S. Robinson, who had served as assistant to the general manager of sales, has been named to the newly created position of manager of carbon steel sales. This new responsibility will include both finished and semifinished carbon steel sales. Frank F. Young has been named assistant manager of the Pittsburgh district sales office. He has been associated with that office for many years.

Jarrett Joins Sales Staff of Bingham Pump

Walter R. Jarrett has joined the sales organization of Bingham Pump Co., Portland, Ore.

Jarrett, a graduate of Missouri School of Engineering, will have St. Louis as his headquarters.

With his industrial and engineering background, Jarrett is well qualified to serve Bingham customers in that territory.

Stewart & Stevenson Erects Engine Testing Chamber

The South's largest commercially owned test chamber for testing starting and operating characteristics of diesel and gasoline engines at temperatures as low as —80° F. has recently been installed in the Houston plant of Stewart & Stevenson Services, distributor of G.M. diesel engines.

One of the contributing factors in the installation of the new cold test chamber, is the increasing demand of government requirements for diesel and gas-driven generator sets for starting and operating at these low temperatures.

(Continued on page 138)

Your MARKET PLACE FOR THE OIL AND GAS INDUSTRY...

CLASSIFIED ADVERTISING

UNDISPLAYED CLASSIFIED 12c a word one issue. 10% Discount three or more issues. $3.00 minimum charge. Blind Box in our care counts nine words. Payable in Advance.

DISPLAY CLASSIFIED
$12.00 a column inch one issue . . .
10% Discount three or more issues.

EQUIPMENT FOR SALE

USED ROTARY AND CABLE TOOL DRILLING TOOLS, WIRE LINES, E. A. KELLY, BOX 861, OKLAHOMA CITY. PHONE 5-6407.

FOR SALE: Complete Brewster CR 300 Rotary Rig, with all tools, 4200′ 3½″ drill pipe, 2 compounded GAK Waukesha Motors. Rig in extra good condition. A bargain at $40,000.00. Just completed well in Butler County, Kansas. A. D. Allison & Co., 715 Brown Building, Wichita, Kansas.

BUCYRUS CABLE Tool Spudder 36-L 1948 Model, perfect condition, 54 foot mast, dual cathead, dual pneumatic tired wheels. All tools from 24″, all accessories. An-Son Petroleum Corp., First National Bldg., Oklahoma City, Okla. Phone 7-4497.

D-13000 Caterpillar power unit; 60 HP 900 RPM slipring motor 3/60/2300; 30 HP 1200 RPM slipring motor 3/60/220; 30 HP 900 RPM slipring motor 3/60/220; 200 AMP. Hobart welder, motor driven, 3/60/220. Phone or write Wesley Steinhoff, Council Grove, Kansas.

Gaso Duplex 4½″ x 6″ Power Pumps with Chrysler C-36 Engines, skid mounted. immediate delivery. Also Byron Jackson, Carter Centrifugal Units. Westinghouse 20-25-50 KW Generating Units.

H. H. COFFIELD
Attn.: W. H. ORR
Phones: 132—Rockdale, Texas
AT-3427—Houston, Texas

COMPLETE PLANTS WANTED FOR LIQUIDATION OR OPERATION

Preferably in the Following Industries:

MACHINERY and METAL WORKING
FOUNDRIES **MINING**
REFINERIES **STAMPING**
DRILLING EQUIPMENT
MILLING and TOOLING
SCREW MACHINING

—and any others

Write • Phone • Wire
Kenneth Kleinman

FABRIKANT STEEL PRODUCTS, INC.
50th Floor, Woolworth Building,
New York 7, N. Y.
Tel. BEekman 3-3041
Cable Address FABKANT, N. Y.

EQUIPMENT FOR SALE

FOR CABLE TOOLS
DEGEN PIPE AND SUPPLY CO.
Box 107, Red Fork Station, Tulsa, Oklahoma

FOR SALE: Two Mayhew 1000 shothole drills, mounted on all-wheel drive, Wheatley 6 x 6 pumps, 500 feet drill pipe, 1000 gallon water tank trucks. Box D-901, The Oil and Gas Journal, Tulsa, Oklahoma.

NEED CASING AND TUBING?

6000 feet new 5½″ 15.50# J-55 Range 2 Casing. 6000 feet new 4.7# J-55 EUE Range 2 Tubing, to be sold with complete drilling rig equipped with Lee C. Moore mast, Oilwell 64B drawworks, hydramatic brake, two NKU Waukesha engines, direct drive rotary with WAK Waukesha and torque converter, C-250 pump, Koehler light plant, Thompson shale shaker, Series 900 Sheaffer blow out preventer, 3 dog houses, 6000 feet 4½″ drill pipe, seven 6¼″ drill collars. All other equipment and appurtenances to make a complete rig, ready to drill. Located in North Texas.

Box D-895, The Oil and Gas Journal, Tulsa, Oklahoma

EQUIPMENT FOR SALE

AVAILABLE for sale and immediate shipment line pipe, seamless and lapweld casing, tanks. Call or write Edco Pipe & Supply Company, Box 565, Drumright, Oklahoma.

FOR SALE: One 5″ x 8″ Denver-Gardner FXX pump. Wm. M. Hanlon, Box 1724, Billings, Montana, Phone 93193.

2″ Standard Pipe

20,000 feet Galvanized
45,000 feet Black
Excellent Used Condition
Immediate Shipment
Subject to Prior Sale

Write—Wire—Phone

Sonken-Galamba Corp.
2nd and Riverview (K-693)
Kansas City 18, Kansas
THatcher 9243

SPOT DELIVERY— DO YOU NEED THESE DESIRABLE ITEMS NOW?

Quantity	Size	Approx. wall	Description
150,000′	1½″ O.D.	.140″	Recond. Seamless Tubing, P.E., 14′ & Over.
50,000′	2″ O.D.	.145″	2.7# Recond. Seamless Tubing, P.E., 14′ & Over.
50,000′	2¼″ O.D.	.140″	Recond. Seamless Tubing, P.E., 14′ & Over.
38,000′	2⅜″ O.D.	.....	4# Good Used Lapweld Range 1 Tubing with New 11½ V-Threads and Collars.
10,000′	3″ O.D.	.300/.375″	9.7# Seamless Tubing, P.E., 23′-26′ Lengths
30,000′	3½″ O.D.	.145″	Recond. Seamless, P.E., 14′ & Over.
200,000′	4″ O.D.	.140/.160″	Recond. Seamless, P.E., 14′ & Over.
2,800′	5½″ O.D.	.....	15½# Good Used Lapweld T&C, Range 1 Casing.
5,000′	6⅝″ O.D.	.....	18.97# Good Grade Used Lapweld, Cleaned, Beveled Ends, 20′ Random Mill Lengths.
7,500′	7″ O.D.	.....	20# Good Used Lapweld Range 1 T&C Casing, 11½ V-Threads.
2,000′	8⅝″ O.D.	.....	25# Good Recond. Casing, T&C, 8 V-Threads, Range 1.
800′	10¾″ O.D.	.....	32.75# Good Used Lapweld T&C Casing, Range 1, New 8 Rd. Thds., & 8″ Long Collars.

THIS MATERIAL IS AVAILABLE FOR IMMEDIATE DELIVERY, SUBJECT TO PRIOR SALE.

OTHER SIZES OF LINE PIPE, SEAMLESS TUBING IN SUITABLE SUBSTITUTE SIZES FOR STANDARD PIPE (EXCELLENT FOR GAS, GATHERING AND FLOW LINES), CASING AND TUBING AVAILABLE FOR IMMEDIATE DELIVERY.

FOR FURTHER INFORMATION, WIRE OR PHONE AT ONCE

A. J. STRUBEL, Broker

SIDney 1791 (Day Phone) **HUDson 8152 (Night Phone)** **4946 Murdoch, St. Louis, Mo.**

EQUIPMENT FOR SALE

EQUIPMENT FOR SALE

EQUIPMENT FOR SALE

LOW PRESSURE GAS OR FLOW LINE
IMMEDIATE DELIVERY—SUBJECT TO PRIOR SALE

200,000′ 4″ O.D. x approximately .150″ wall once used thoroughly reconditioned seamless steel tubing, 14′ lengths and over, ends ready for welding.

2,400′ 24″ O.D. x 14 gauge excellent used spiral weld pipe; 20′ lengths with Naylor wedge lock coupling.

For full details contact

A. J. STRUBEL, BROKER

SIDney 1791 (Day Phone) HUDson 8152 (Night Phone) 4946 Murdoch, St. Louis, Mo.

FOR SALE: 40 H.P. Bettis steamer, Tanks and steamer cab, Tools, Conns, Steam hose. On 1948 2-Ton Chevrolet truck. Price $3500.00. Frank Jones, McPherson, Kansas.

ONE heavy duty Maphey Type B Measuring Reel with weight indicator, driven by gasoline engine, mounted on four wheel trailer. Box 11054, Ft. Worth, Texas.

FT. WORTH SPUDDER Super D, chain driven sand reel, heavy duty steel mast, Hercules drilling motor. Complete including all drilling tools, fishing tools, casing elevators, spider and slips. Ford Bullnose truck with winch and gin poles, water line and casing. Now running and ready to go, near Tulsa. Home Buyers Realty Co., 1141 East 37th St., Phone 77178 or 77628, Tulsa, Oklahoma.

FOR SALE: At Oklahoma City, 13—Used #8500 Electric IBM Time Card Recorders with Card Racks—each $150.00. Cities Service Oil Company, Patridge, Bartlesville, Oklahoma.

FOR SALE—Allis-Chalmers Model "U-E" Double Drum Wench Tractor with Rubber Mounted Gin Pole complete with tools for 7500-foot tubing job. Dirks Brothers, Tuleta, Texas.

TRADE: OIL FIELD TRUCK, 1946 K-7 International. Equipped with Tulsa winch. Will consider oilfield pup trailer on trade in. Earl F. Wakefield, 307 Union National Bank Building, Wichita, Kansas.

FOR SALE: 36-L Bucyrus-Erie Spudder, with L1-600 Cummins Diesel Engine, Unit skid mounted, 54′ steel telescoping mast, with catheads, 5″ to 7″ tools, new lines, steel dog house, 3 K.W. Diesel light plant, steel structure and floors. All equipment practically new. Will furnish inventory on request. J. C. Shaffer, Inc., P. O. Box 4365, Oklahoma City, Okla. Ph. 6-9905.

FOR SALE at Tallant, Oklahoma: One 8′ x 15′ welded horizontal tank, 3/16″ shell, ¼″ head, $350. Cities Service Oil—Patridge—Bartlesville, Oklahoma.

FOR SALE: Patented Gas Lift for flowing or pumping wells, successfully used for a number of years. This would be an excellent proposition for Petroleum Engineers, or Production Men with practical experience. Will sell for cash, or might consider good producing royalty, or settled production. Box D-893, The Oil and Gas Journal, Tulsa, Oklahoma.

2000 Ft. 2½″ Upset 10-Thread Range 2 Seamless Tubing. Condition Excellent. 2—210 Bbl. Welded Steel Stock Tanks—Used 1 year for Diesel Fuel Storage. 900′ 7″ 23# Seamless Casing Range 2—500′ New 8 Round Thread, 400′ Used 10 Thread. Jay Kornfeld, 1121 Union National Bank Bldg., Phone 4-2121, Nite 6-0996. Wichita, Kansas.

FOR SALE: Practically new, approximately 3160′, 3″ EUE tubing, 8-round thread, 9.30# seamless. Write: Lawrence and Meltzer Oil Company, Box 414, Great Bend, Kansas.

FOR SALE—ROTARY DRILLING RIG—1 ALLIS-CHALMERS L90 Commercial Motor, and 3,500 ft. of Upset Tubing. Will sell separate. C. A. Griffith—901 Houston—Plainview, Tex. Phone 1119-J.

ELI-M6W ROTARY DRILL mounted on Chevy Truck; Coleman conversion, G.D. Pump, Wash Pipe, Suction and Pressure Hose. Hex Kelly, Slips and Adapter; Hoisting Plug; 190′ Drill Pipe, Front End Winch King; 9 Bits; Tool Kit. Box D-890, The Oil and Gas Journal, Tulsa, Oklahoma.

TRADE new 7″ seamless casing or cash for good used 24L spudder. Box D-905, The Oil and Gas Journal, Tulsa, Oklahoma.

ONE oilwell 36-P Triplex Pump in new condition. Stainless steel plungers and valves. Box 11054, Fort Worth, Texas.

HAVE a Gas Plant for Sale: Production can easily be doubled. Write T. E. Davis, Box 207, Davis, Oklahoma.

CARDWELL Spudder, Model R-L (largest), complete with 4 leg mast, wire lines, Waukesha engine, 5 and 7 inch tools, steel doghouse, etc. In first-class shape, ready to go, price $13,000.00 E. E. Brook, 807 Colcord Bldg., Okla. City, Okla. Phone 3-7530.

FOR SALE: USED Failing Model 36 drill, truck mounted with operating equipment. Franks Machine Co., Enid, Oklahoma. Phone 62.

FOR SALE: PIPE COUPLINGS, 2″—3″—4″—6″ and 8″—Casing Couplings 5½″ OD x 8 Rd. and 11½V. All new, perfect. Julius M. Fogelman, Reading, Pa.

FOR SALE: Double Drum Wilson Well Servicing Machine with Pole, powered with 100 Horsepower Waukesha. With or without K B-7 International Truck. Write E. N. Brock, Box 125, Artesia, New Mexico. Phone 423-J.

EQUIPMENT WANTED

WANTED—Large or small spudder, with or without equipment; give age, condition, price. C. A. McMillen, 117 East Main St., Titusville, Pa.

WILL buy good used pumping unit with approximately 10 H.P. rating. Would prefer Jensen 10D or equivalent available near Nowata area. Box 237, Chetopa, Kansas.

HELP WANTED

HELP WANTED

WANTED: RESEARCH AND DEVELOPMENT ENGINEERS AND PHYSICISTS WITH EDUCATIONAL BACKGROUND IN MECHANICAL, ELECTRICAL OR ELECTRONIC ENGINEERING, PHYSICS OR ENGINEERING PHYSICS FOR OPENINGS IN PLANT AND LABORATORY INSTRUMENTATION, PHYSICAL MEASUREMENTS, GEOPHYSICS, AND INDUSTRIAL ELECTRONICS. PREFER PERSONS WITH TWO TO FOUR YEARS EXPERIENCE IN EXPERIMENTAL RESEARCH DESIGN AND DEVELOPMENT OF INSTRUMENTS, INTRICATE MECHANISMS, ELECTRONIC APPARATUS, OPTICAL EQUIPMENT, SERVOMECHANISMS OR ALLIED FIELDS. POSITIONS ARE OF IMMEDIATE AND PERMANENT IMPORTANCE TO OUR OPERATIONS. WRITE PERSONNEL DIRECTOR, RESEARCH AND DEVELOPMENT DEPARTMENT, PHILLIPS PETROLEUM COMPANY, BARTLESVILLE, OKLAHOMA.

WANTED
REFINERY PERSONNEL

By an American Oil Company in South America

Chief Chemist—College degree and minimum five years' responsible experience in oil refinery control laboratory.

Process Supervisor—Engineering degree and minimum of five years' responsible oil refinery experience to coordinate refinery operation and be responsible to refinery superintendent.

Designers—Structural and piping designers are required. Graduate Mechanical or Civil Engineer with approximately six years' experience as a designer in a modern oil refinery.

Pipeline Engineers—Degree and four to ten years' experience in design and construction of pipelines, gathering systems, pump stations, tank farms and terminals.

Equipment Inspector—Graduate Engineer with minimum of four years' experience in refinery equipment inspection required.

Instrument Supervisor—Graduate Engineer thoroughly experienced in gas measurements, gas testing, and instrumentation of crude stabilization and natural gasoline plants.

Process Designer—Must have Chemical Engineering degree and several years' responsible experience in oil refinery process design or process control.

Maintenance Engineers—Mechanical or Electrical Engineers with a minimum of five years' experience in a modern oil refinery to work in coordination and supervision of oil refinery maintenance and construction.

Corrosion Engineers—Degree and minimum of five years' experience in corrosion engineering. Will be required to make studies and investigations of causes and nature of corrosion.

Write giving age, education, marital status, and details of previous experience. Your communications will be held in strict confidence.

Box 308-R
Radio City Station
New York 19, New York

EQUIPMENT WANTED

WANTED TO PURCHASE: Used Fuller Compressor for natural gas boost. Any size from C-40 to C-100, single or 2-stage, compressor unit only or assembly with natural gas engine. Wheeler Gas Co., Box O, Wheeler, Texas.

WANTED: 7¼ x 10 Gardner-Denver Slush Pump. Box D-902, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED AT ONCE: Good used Shaffer Blowout Preventer, Type 45, 900 series, 10¾" to 11¾" singles gate, 10" nominal gate, 11" minimum bore, 6,000 pounds test, complete with type 39 blank rams, universal joints, rods and hand wheels. Advise price and location. Gehring Equipment Co., P. O. Box 2290, Phone 4170, Casper, Wyoming.

WANTED

New or nearly new 5½" O.D. H-40 or V-55 seamless oil-well casing. Also 2" upset tubing. Abandoned oil wells. Furnish complete details.

A. C. R. CO.
19615 Nottingham Road
Cleveland 10, Ohio

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ENGINEERS, EXECUTIVES, TECHNICAL MEN. SALARIED POSITIONS—$3600 TO $30,000. THIS CONFIDENTIAL SERVICE FOR OUTSTANDING MEN WHO DESIRE A CHANGE OF CONNECTION. WILL DEVELOP AND CONDUCT PRELIMINARY NEGOTIATIONS WITHOUT RISK TO PRESENT POSITION. SEND NAME AND ADDRESS FOR DETAILS. TOMSETT ASSOCIATES, 1204 BERGER BLDG., PITTSBURGH 19, PA.

EXPERIENCED GEOLOGIST qualified for geological work in connection with reservoir engineering. Five years experience necessary. Experience in Permian Basin desirable. Box D-857, The Oil and Gas Journal, Tulsa, Oklahoma.

EXPERIENCED Sales Engineer to represent established valve manufacturer. Primary objective is development of Petro-Chemical and Industrial outlets, but also to contact Petroleum Producing, Refining and Pipe Line Industries. Technical background and some knowledge of chemicals and metallurgy required. Our men know of this advertisement. Box D-875, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: Party chiefs, observers, computers for work in Canada. Minimum five years experience required. Do not apply otherwise. Give complete experience record. Box D-910, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: Associate or full professor of Petroleum Engineering in a leading institution. Must have successful professional and research background. Work to begin September fifteenth. Box D-897, The Oil and Gas Journal, Tulsa, Oklahoma.

FOREIGN and Domestic Oil Employment Directory covering the oil industry, showing where to apply for jobs. Price $5.00 Oil Industry Mailing List. Box 2603, Tulsa Okla.

SALES ENGINEERS
OPERATIONS SUPERVISORS
PERFORATOR OPERATORS
Only Experienced Men Need Apply
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3909 Hemphill Street, Fort Worth 9, Tex.

PETROLEUM ENGINEER

Prominent chemical concern in Michigan desires petroleum or chemical engineer with operating experience in Petro-Chemical plant or refinery, for position as Assistant Superintendent in Glycol producing plant. Age 30-45. Excellent opportunity. Give full details in first letter.

Box D-904
THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

SITUATIONS WANTED

EXPERIENCED PETROLEUM GEOLOGIST Single, Draft-exempt, Nine years major company experience, four years independent geological experience. Specialist in all phases subsurface and well work. Opportunity for advancement important. Location—open. Box D-874, The Oil and Gas Journal, Tulsa, Oklahoma.

DRILLING Contractor operating in West Texas and New Mexico desires to contact small or medium-sized independent oil company who needs an operating manager. Personal interview desired. Twenty years experience in all phases of the oil industry. Address replies to Box D-644, The Oil and Gas Journal, Tulsa, Oklahoma.

ATTENTION: Well established oil well drilling contractor desires to manage and supervise: Individuals', groups', small or medium-sized oil companies' drilling, production and operating problems in Central and Western Texas, and New Mexico. Personal interview by appointment is desired. Makin Drilling Company, Box No. 131, Ph. No. 131, Hobbs, New Mexico.

PETROLEUM GEOLOGIST, ten years varied experience desires responsible position in Rocky Mountains or Foreign. Presently employed; speak four languages. Box D-879, The Oil and Gas Journal, Tulsa, Oklahoma.

PIPE LINE corrosion and communications engineer with ten years experience will consider another position. Box D-884, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM ENGINEER—PRODUCTION SUPERINTENDENT: 23 years experience in drilling and production operations; 12 years experience general production engineering; supervisory experience completion and workover operations. Desire connection with independent operator. Box D-896, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM ENGINEER - GEOLOGIST—Age 32, six years with Major and Independent companies, all phases production and development engineering. Desires position as Geological or Production Engineer with substantial independent oil company, Calif. or Mid-Continent area. 30 days notice. Reply Box D-898, The Oil and Gas Journal.

SENIOR stratigrapher, 15 years experience surface and subsurface. Prefer research position, Midcontinent or Rocky Mountain areas. Box D-909, The Oil and Gas Journal, Tulsa, Oklahoma.

CRUDE OIL TREATING ENGINEER
A real expert with several years experience desires change. Go anywhere, even foreign. Box D-907, The Oil and Gas Journal, Tulsa, Oklahoma.

NATURAL GAS — Mechanical engineer with twenty years experience development, production, transportation, desires change from present connection. Box D-903, The Oil and Gas Journal, Tulsa, Oklahoma.

LEASE AND DRILLING BLOCKS

SITUATIONS WANTED

ASPHALT—Supervisor or technical director. Specialist in asphalts desires responsible supervisory position in asphalt refinery operations or product development, research, including paving technology, specialties, additives. Box D-908, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM ENGINEER: Married, 32, graduate of the University of Tulsa, one year petroleum production experience. Will consider any petroleum engineering position offering opportunity for advancement. Box D-894, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGIST: 10 years experience in exploration work (subsurface, core drill, seismic) desires connection with company or individual who can use this type of experience. Prefer Southern location. Box D-906, The Oil and Gas Journal, Tulsa, Oklahoma.

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SPOT CASH PAID FOR PRODUCING ROYALTY. SMALL TO LARGEST BLOCKS IN SETTLED OR OLD PRODUCTION ONLY. Oil Specialists since 1934. GERBER & CO., 120 WALL STREET, NEW YORK.

DEEDED ROYALTIES
San Juan Basin & Permian Basin. Write Harry S. Wright, Wright Bldg., Farmington New Mexico.

MONTANA ROYALTIES

Millions of acres now leased by world's major companies, with huge drilling play in prospect. For booklet describing Montana geology and oil development, write Landowners Royalty Company, Box 1225, Great Falls, Montana.

PRODUCING Oil wells and Royalties wanted. Send particulars. FIELDS, 310 Railway Exchange Bldg., Kansas City, Missouri.

LEASE AND DRILLING BLOCKS

PLANNING to develop a partly proven oil-gas field in Allegany County, N. Y. Interest may be had for cash or good used casing, drive pipe and well equipment. If interested, write for details. C. N. Wilber, Box 625, Westfield, Pa.

FOR SALE: Oil and Gas Leases adjoining producing leases, also wildcat leases, Drilling propositions and small producing properties; all in shallow territory. W. P. Harley, Bowling Green, Ky.

LEASES ROYALTIES

Producing and Nonproducing
Bought and Sold—Any Area
Inquiries Invited

B. D. BUCKLEY
6635 Delmar Ave., St. Louis 5, Mo.

FOR SALE

PROPERTY IN PARADIS OIL FIELD

St. Charles Parish, Louisiana

Hibernia Bank & Trust Company, in Liquidation is inviting offers for the purchase of certain of its interests in the Paradis Oil Field involving over

9000 ACRES

For particulars write:

Hibernia Bank & Trust Company, in Liquidation

Jasper S. Brock, State Bank Commissioner
Thos. B. Kennair, Special Agent
J. Edward McGuire, Liquidator
405 Baronne Bldg., New Orleans, La.

BUSINESS OPPORTUNITIES

WELL ESTABLISHED British oil equipment and supply company with head office in London is interested in acting as European and Sterling Area sales representative for all classes of equipment and supplies connected with the oil and mining industries. Box D-886, The Oil and Gas Journal, Tulsa, Oklahoma.

WILL trade interest in 160 acres in northeast Oklahoma with a 12-bbl. well producing and another well being drilled. We want casing, tubing and pumping equipment. Box 237, Chetopa, Kansas.

WILL make an exceptionally good deal to a responsible operator for drilling 1,800' well on 1,500 acres in northeast Oklahoma. Two horizons already producing. Excellent geology. Box 237, Chetopa, Kansas.

PATENT ATTORNEYS

PATENT Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommell, Registered Patent Attorneys, Suite 418. 815-15th Street, N.W., Washington 5, D. C.

FOR RENT OFFICE SPACE

OFFICE SPACE FOR RENT, ODESSA, TEXAS, Heart of the Permian Basin. Several choice office spaces still available in modern building now being completely redecorated. Located in downtown ODESSA, heart of the Permian Basin and the supply and drilling capital of West Texas. On leases 2 years or longer, owner will rearrange layout to suit tenant. In face of building restrictions these spaces should be disposed of by May 1st. Request on your letterhead or phone call will bring floor plan and particulars. Direct inquiries to: M. LAVY, Box 2152, Odessa, Texas. Phone 2475.

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Houston, Texas

5500 square feet, second floor, air-conditioned office space, in building of outstanding design, available about July 1, 1951.

Adjacent to Shamrock Hotel, Texas Medical Center and new Prudential Southwest Home Office Building. An ideal location for Oil Operators, Insurance or Finance business, etc. This ultra modern Center will house the new Braeswood Postal Station.

Braeswood Center, Inc.
2265 W. Holcombe Blvd.
Houston 5, Tex.

WANTED

BIDS WANTED FOR WATER WELLS: BASIS OF 100 WELLS MINIMUM, 18 TO 24 INCH HOLE, DEPTH 300 FEET. BID BOTH PER WELL AND PER FOOT BASIS ON COMPLETED WELLS. ALSO YOU FURNISH OR WE FURNISH CASING. DRILLING IN CENTRAL MEXICO FOR AMERICAN FIRM. FURTHER INFORMATION WIRE OR CALL HILL AT JUSTIN-2226, ADDRESS BIDS P. O. BOX 9687, DALLAS, TEXAS.

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EQUIPMENT MEN

(Continued from page 134)

Totco Expands Field Staff In Mid-Continent Area

Because of increased activity in the West Texas-New Mexico area, Technical Oil Tool Corp., Ltd., has expanded its field staff.

H. H. (Pete) Peters, Totco vice president, has announced that Don W. Gibbs was recently appointed to serve as an added representative in the Odessa area. John L. McClaran was also appointed to replace Lloyd Stack at Abilene, Tex. Stack was called back to service in the U. S. Marine Corps.

Peters reports that with these changes Totco Mid-Continent manager, E. G. McConnell, now has a total of 22 men operating in the Mid-Continent area.

Yale & Towne Names Heimer To Succeed W. G. Tipton

Appointment of Edwin J. Heimer as sales manager of hand-lift and motorized hand trucks made by the Philadelphia division of Yale & Towne Manufacturing Co. has been announced by James P. Kinney, general sales manager. Heimer will succeed W. Glen Tipton, who is retiring from business activities on March 1.

Heimer was formerly a vice president of Clapp & Poliak, Inc. Prior to joining Clapp & Poliak in 1948, he was president of Barrett-Cravens Co., of Chicago, manufacturers of material-handling equipment. He previously spent several years as vice president in charge of sales and advertising of the same firm.

Anderson Named Petroleum Engineer at Tulsa Office

Kenneth W. Anderson has been appointed petroleum engineer of Blaw-Knox Co.'s Tulsa office.

Anderson was graduated from University of Tulsa in 1938 with a degree in petroleum engineering and has had 12 years' experience in the design and operation of refinery and gasoline plants. He has also worked on special direct-fired furnace designs for the petroleum and natural-gas industries.

In his new position Anderson will be assigned to the oil and gas department of the Blaw-Knox Chemical Plants Division, and will serve the petroleum and processing industries of the Southwest.

Johnston Holds First Annual Sales Meeting

Men who attended sales meeting conducted by Johnston Pump Co. at Los Angeles are: Bill Walmsley, Lyle Pritchard, Ned Rowland, Ralph Linderman, W. G. Magruder, Jack Dicmas, C. R. Spencer, Perry Brown, Tommy Sewell, John Maple, Jim Wyche, Ivan Webster, H. W. Gilliland, Tom Simmons, M. S. Myer, K. G. Lundie, and R. E. Rolling.

Recently Johnston Pump Co., Los Angeles, invited its district managers from the United States and Canada to Los Angeles for the first general sales meeting conducted by the company. The conferences, which were held at the Biltmore Hotel, lasted for 3 days. Subjects covered included new products, engineering, manufacturing, credit, procurement, and sales problems. K. G. Lundie, vice president in charge of sales at Johnston, stated that conferences would be held annually in the future.

Franks Names Corry to Oklahoma Sales Post

S. E. CORRY

Stuart E. Corry has been appointed district sales and service manager in Oklahoma for Franks Manufacturing Corp., of Tulsa, according to Carl White, Jr., president.

Corry joined Franks' engineering department in 1943 and successively became district manager of Illinois basin area; district manager at Houston, and chief products engineer. Corry will also head a new sales and service branch being opened in Seminole, Okla.

Blackie Clark Well Service & Tool Co. Organized

Blackie Clark, squeeze-cementing and well-control engineer, has announced the formation of Blackie Clark Well Service & Tool Co. The new organization will have offices in Houston, Corpus Christi, and McAllen, Tex. M. H. (Mike) Hicks is general superintendent of operations. The company specializes in squeeze cementing, bridging, acidizing, and control of wild wells.

Clark has been in the drilling end of the oil business since 1919. Hicks has had 17 years of experience in cementing, testing, perforating, and squeeze-tool work. Other members of the organization are C. E. Crayton, Houston, who has been in the business for 16 years; R. F. Clinkscales, Corpus Christi, with 20 years' experience; Les Cummings, Houston, who specializes in gas-lift and production problems, has 12 years' experience in cementing, perforating and gas-lift operations; Joe H. Clark, assistant general superintendent, with 25 years of experience in cementing, testing, and squeeze-tool work.

Officials of the new Blackie Clark Well Service & Tool Co. are Les Cummings, Blackie Clark, and M. H. Hicks.

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Permian Basin

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John B. Rector Sur., 12½ mi. E Guthrie, dry, TD 5,390 ft. in Strawn topped at 5,322 ft.

Runnels County: John K. Dorrance 1 R. E. Cole, Sec. 85, T&NO Sur., dry, TD 4,905 ft., elev. 1,805 ft., Swastika 3,036 ft., Morris 4,060 ft., upper Capps 4,362 ft., Goens 4,466 ft., Caddo 4,778 ft., Ellenburger 4,900 ft.

Tom Green County: Ryan, Hayes, & Burke 1 Nona Kent, Sec. 184, Dist. 11, SPRR, 14 mi. SE San Angelo, dry, TD 4,824 ft., elev. 2,001 ft., Canyon 4,113 ft., Strawn 4,635 ft.

SOUTHEASTERN NEW MEXICO

HOBBS. — Southwest of the Brownfield discovery well, Lea County, McAlester Fuel Co. 1 Simpson in 26-12s-37e, had prospects for a successful completion from what has tentatively been called the Wolfcamp. The well was plugged back after drilling 48 ft. into the Devonian topped at 12,240 ft. A flow of 18 bbl. of oil an hour was developed on a test from 9,750-65 ft. The flow was through ⅜-in. choke, under tubing pressure of 325 psi.

Phillips Petroleum Co. 1 Denton, northwest offset to the Denton Devonian discovery, flowed 31 bbl. of 45°-gravity oil an hour on a test near the top of the Devonian from 11,465-11,650 ft., then found additional pay in drilling to 12,216 ft. Drill-stem test from 12,166-216 ft., open 3½ hours, flowed the water blanket in 73 minutes and oil in 87 minutes, and in 2 hours gaged 58 bbl. of 45°-gravity oil. Oil in the pipe was circulated out and drilling resumed.

West of Bagley area, H. S. Moss 1 State recovered 748 ft. of salty mud having a slight show of gas on a 90-minute test of the Wolfcamp from 8,640-8,758 ft. Top of the Wolfcamp was 8,500 ft.

In Eddy County Continental Oil Co. 1 Thurman-Federal, wildcat 28 miles south of Chisum field, was drilling below 6,552 ft. Drill-stem test of the Wolfcamp at 6,315-45 ft. recovered 30 ft. of mud with no shows. Top of the section was 6,322 ft.

In Chaves County, Magnolia Petroleum Co. 1 Jackson-State, 36-8s-28e, topped the Devonian at 7,306 ft. and tested sulfur water, cut with some gas, from 7,301-14 ft.

SOUTHEAST NEW MEXICO SUCCESSFUL WILDCAT

Lea County: Wilson Oil Co. 2 Charlotte-State, 32-20s-36e, TD 3,860 ft., gas sand 3,842 ft., 2,500,000 cu. ft. gas a day, open 2-in. tubing.

SOUTHEAST NEW MEXICO WILDCAT FAILURE

Chaves County: Honolulu Oil Corp. 1 McConkey, 10-9s-26e, dry, TD 6,371 ft., elev. 3,843 ft., San Andres 1,020 ft., Glorietta 2,220 ft., Pennsylvanian 5,480 ft., Hueco 5,710 ft., Ellenburger 6,097 ft., pre-Cambrian 6,358 ft.

TEXAS PANHANDLE (DISTRICT 10) WILDCAT FAILURE

Collingsworth County: Gem Oil Co. 1 Hamilton & Deaver, 36-19-H&GN, 14 mi. WSW Wellington, dry, TD 7,072 ft. in lime and chert, elev. 2,079 ft.

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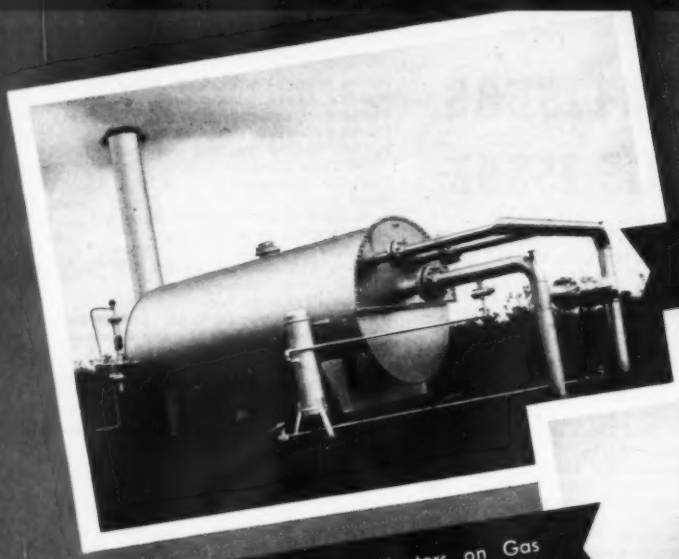

6' x 12' Indirect Heater on Gas Gathering System.

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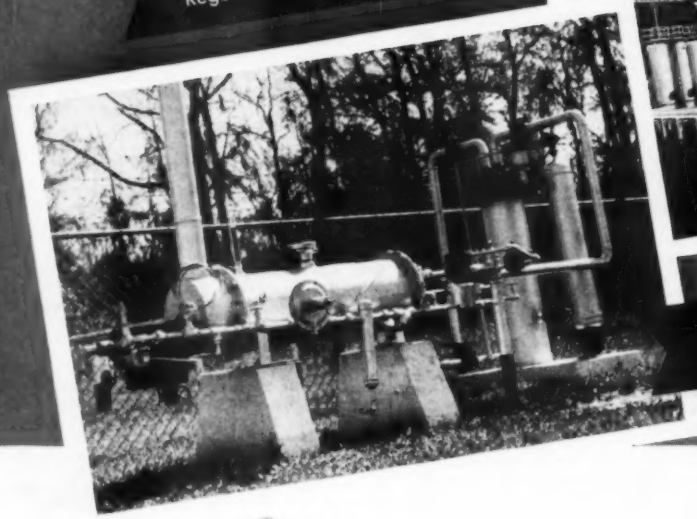

18" x 5' Indirect Heater in a Gas Measurement Station.

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What Hughes field service means

Good service, to us, means *anticipation* of your needs *at the rig*.

Hughes Tool field men keep in constant personal touch with every rig in their territory, consulting with pushers, drillers and other field personnel on rock-bit performance and requirements.

The Hughes service organization consistently covers all of the active oil fields in the U. S. and Canada wherever you find rotary drilling. Hughes men visit more rigs more times. This vigilant Hughes service anticipates rock-bit requirements to insure having the *right bit* at the *right time*.

Hughes Tri-Cone Rock Bits